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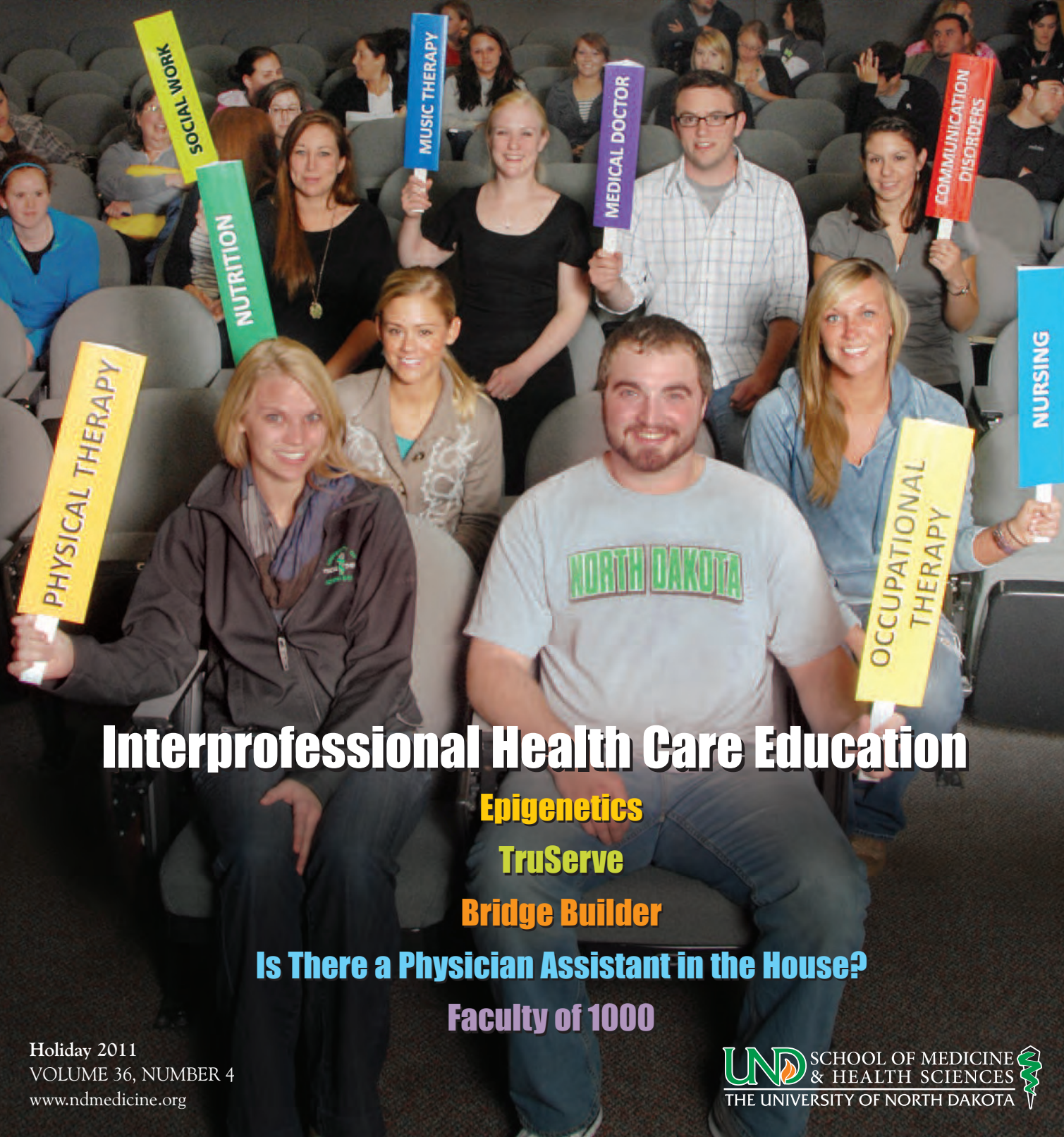
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NORTH DAKOTA MEDICINE

THE UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE & HEALTH SCIENCES



Interprofessional Health Care Education

Epigenetics

TruServe

Bridge Builder

Is There a Physician Assistant in the House?

Faculty of 1000

Holiday 2011
VOLUME 36, NUMBER 4
www.ndmedicine.org

UND SCHOOL OF MEDICINE
& HEALTH SCIENCES
THE UNIVERSITY OF NORTH DAKOTA

2010 - 2011 DONOR ISSUE

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Homegrown Health Care for North Dakota



As 2011 winds down to a close, I'd like to provide an update on several programs and projects that might be of interest to you, especially those that I've touched on before. Perhaps most innovative is the expansion of the state's residency (post-MD degree) training programs. What is unique about what we've been able to accomplish in North Dakota is that the state is providing the funds to support nine new residency slots. Most residency training is supported by the federal government, mainly through the Medicare program. Yet the number of residency slots across the country has been effectively capped by the Balanced Budget Act of 1997; as a consequence, growth in the number of medical student graduates has exceeded by more than a factor of two the much slower growth in residency slots, most of which have been funded through hospital revenues. And where medical students take their residency really matters—about two out of three of our graduates who take a residency in North Dakota remain in North Dakota to practice medicine for the long term. We are extremely fortunate in North Dakota that our Legislature has provided funding for not only an increase in class size, with eight new medical and 15 new health sciences student slots, but also the nine new residency slots. We believe that this will result in more physicians practicing in North Dakota—just what the doctor (and patients!) ordered.

As the Health Services Interim Legislative Committee considers our request to “double down” the current expansion of class size with a similar increase in the 2013 legislative session, we are studying our facility needs for the future. Thanks to an appropriation

from the Legislature, we have engaged the local architectural firm JLG Architects, which in conjunction with the design firm of Perkins+Will are in the process of studying our physical plant needs for now and in the future. We held a town hall meeting recently to solicit input from a wide variety of stakeholders, from students to staff to faculty. We expect the final report from JLG within the next month or so.

The Master of Public Health (MPH) Program, a joint venture with North Dakota State University, is on track to welcome its first students in the fall semester of 2012. Our program is a first in North Dakota—and maybe the country—where two major universities have developed a truly integrated program that offers the best of the two organizations at a reduced cost to the taxpayers. Who could object to that? While we are still working out some of the expected administrative glitches, the integrated program that we'll offer less than a year from now should be exceptionally strong and attractive to students. Until now, students who wanted advanced public health education had to go out of state to get it. That is no longer the case, and we thank Dr. Terry Dwelle, the state health officer, for first encouraging both NDSU and UND to develop the program, and then lending a guiding hand as we prepare the course offerings.

The School recently completed and distributed its first annual report to the community, called *Vital Signs: 2011 Community Report*. It provides a report card on how we're doing as an institution. The feedback from readers has been uniformly positive. One particularly helpful suggestion was to incorporate some performance goals for

the future. We plan to do so next year so that you can not only see what we actually achieved but also see to what we aspire. Then you can judge how well we're doing in reaching the goals. If you didn't see a copy—or would like your own—it can be accessed at <http://bit.ly/oJ43ok>.

The School has four faculty searches underway, and we expect all searches to be completed within the next four to six months. The first relates to our search for the director of our MPH program. The next is for the founding chair of our soon-to-be consolidated basic science department, which will bring together four currently separate groups into one. The third search is for the next associate dean for student affairs and admissions, to replace our beloved Judy DeMers who retired after nearly three decades of service to the SMHS. The last search is for the director of our geriatrics program, which should be attractive to highly qualified candidates since we can offer not only an endowed chair to the incumbent (thanks to a very generous gift from the late Dr. Eva Gilbertson) but additional funding to build a geriatrics training program (thanks to outstanding support from the state legislature).

I'd like to thank all of you who have supported the SMHS and our students with your time and treasure. Both are essential to the efforts of the School to provide the necessary workforce for North Dakota, and to be an agent for improving the health of North Dakotans. We have over 900 clinical faculty members from around the state who volunteer their time to help train the next generation of health care providers. And the financial contributions of alumni and others are critical in this time of scarce new resources. The average medical student graduates with over \$160,000 in debt, and scholarship and loan support is

essential to lighten this crushing burden, especially since many students are married and have children. As you consider your priorities this holiday season, I hope that you keep in mind the many fine young medical and health sciences students who are working hard to become the very best providers they can be—regardless of the cost. Please help me to help them, and do what you can to lighten their load.

My wife Susan and I wish you the most wonderful of holiday seasons, with best wishes for a healthy, happy, and peaceful New Year.



Joshua Wynne, MD, MBA, MPH
Vice President for Health Affairs and Dean

UND researchers discover age-associated changes in immune responses to plague

UND researchers have discovered age-associated changes in host immune responses to plague, beginning as early as the human equivalent of very early middle age. These findings will allow the research team of David S. Bradley and Matthew L. Nilles to understand the mechanisms that result in increased age-associated susceptibility to plague, and likely immune responses to other microbes. Up until now, most studies of age-related losses of immune response have focused on the very elderly, at which time the host's immunity is usually significantly suppressed and the mechanisms leading to this suppression are difficult to elucidate.

Plague is caused by the extremely virulent pathogen *Yersinia pestis*. Most known for its widespread and devastating



Yersinia pestis

effects during the Dark Ages, plague naturally cycles through periods of quiescence that may last decades. However, it can manifest its ugly and deadly effects quickly—the last urban epidemic in the United States was in Los Angeles in 1924–1925, and an outbreak in India in 1994 drew world attention because it was the

pneumonic form, passed from person to person, unlike the plague during the Dark Ages in Europe that was primarily bubonic, carried by ticks from rats. Plague remains endemic in the western United States, including the prairie dog population in western North Dakota. Nathaniel D. Lambert, Deanna M. Langfitt, Matthew L. Nilles, and David S. Bradley from the Department of Microbiology and Immunology at the UND School of Medicine and Health Sciences were the authors of the research paper describing their findings about plague. Nilles, an internationally recognized expert on the *Yersinia pestis* bacterium, leads the plague research effort at the School, and Bradley, chair of the department and leader of the larger infectious disease research focus at UND, is an internationally recognized expert on host immune responses to microbes and related vaccines and immunotherapeutics. Bradley and Nilles have a long collaborative research relationship, reaching back more than 13 years, in studying interactions between hosts and pathogens. Their research paper can be found at the American Society for Microbiology's website at <http://bit.ly/qvirK2>.



David Bradley



Matthew Nilles

Interment Ceremony honors donors of Deeded Body Program

An interment ceremony honoring the memory of those who donated their bodies for the benefit of medical education took place at the University of North Dakota School of Medicine and Health Sciences plot at Memorial Park Cemetery in Grand Forks. Family members and friends attended the service on Friday, September 23, where the School paid respect and tribute to donors of the Deeded Body Program.

"The interment service is a special time to recognize and thank a group of men and women who have made whole-body donations in a sincere effort to positively impact our teaching program, and to make a profound difference in the lives of many young aspiring physicians," said Dr. Edward Carlson, Chester Fritz Distinguished Professor of Anatomy and Cell Biology.

"The value of this gift is immense and cannot be overstated," he said.

The School conducts this ceremony once every three years to inter the cremated remains of donors who have chosen to be interred in the UND School of Medicine and Health Sciences' plot. Family members of donors being interred were invited, as well as the School's faculty, staff, and students.

Jason Askvig, a Department of Anatomy and Cell Biology graduate student, spoke from a student perspective about the value and significance of the Deeded Body Program.

Local clergy who participated in the service were pastors Chad Brucklacher of Christus Rex Lutheran Campus Center at UND, Jerry Bass of Wesley United Methodist Church, and Father Gerard Braun of St. Michael's Catholic Church. Stennes Funeral Home of East Grand Forks assisted with the interment service.

Dr. Mandy Meyer, assistant professor of occupational therapy and anatomy and cell biology is director of the Deeded Body Program.



First PA Appointed to North Dakota State Board of Medical Examiners

Kate Larson, PA-C, has been appointed by North Dakota Governor Jack Dalrymple to the North Dakota State Board of Medical Examiners. Senate Bill 2154, which was signed into law this past spring, called for the governor to appoint a physician assistant to the state board of medical examiners. North Dakota was the last state to formally include PAs in the regulation of the profession. There are now 17 states that currently have PA representation on their medical boards.

Larson graduated from the University of North Dakota PA program and has been practicing at the Garrison Family Clinic in Garrison, N.D., since 1995. Her four-year appointment to the board expires on July 31, 2015.

Nordlie and Kutch are Alumni Association award recipients



John Kutch



Robert Nordlie

2011 Sioux Award recipient

Dr. Robert Nordlie, '57, '60: Dr. Nordlie is a retired Biochemistry professor from the UND School of Medicine & Health Sciences. Dr. Nordlie dedicated 38 years of his career to the SMHS and served as the chair of the Biochemistry and Molecular Biology department from 1983 to 2000. He has published more than 130 papers and was a member of 16 professional and scientific organizations.

2011 Young Alumni Achievement Awards recipient

John Kutch, '93: John is the President/CEO of Trinity Health in Minot, N.D., where he has successfully recruited more than 70 physicians to the region. Kutch is a member of several professional and civic organizations and serves on the UND School of Medicine and Health Sciences Advisory Council representing the west region, and various advisory boards for the Greater Minot Area.

Geiger elected to serve central region of NAIPI

Jonathan D. Geiger, PhD, Chester Fritz Distinguished Professor; chair of the Department of Pharmacology, Physiology, and Therapeutics; interim chair of the Department of Anatomy and Cell Biology; and principal investigator for UND's Center of Biomedical Research Excellence (COBRE) grant on Pathophysiological Signaling in Neurodegenerative Diseases, was elected to a four-year term to serve the central region of the National Association of IDEa (Institutional Development Award) Principal Investigators (NAIPI).



The purpose of the NAIPI is to (1) foster interactions between the IDEa program and its constituencies; (2) promote resource sharing among the IDEa Network of Biomedical Research Excellence and COBRE programs; (3) enhance the visibility of the IDEa Program; (4) develop a consensus on priorities and new directions for IDEa; (5) identify and disseminate best practices within the IDEa program; and (6) identify opportunities and develop strategies to achieve the common goals of the IDEa program.

9th Annual American Indian Health Research Conference

The 9th Annual American Indian Health Research Conference was held on Friday, October 28, at the Alerus Center in Grand Forks. In addition to offering opportunities to discuss research directions, partnerships and collaboration in health research focusing on American Indians, the conference featured distinguished speaker Dr. Gayle Skawennio Morse. She is an enrolled member of the Mohawk Tribe, and draws from the tribe the principles of respect, trust, and empowerment that have guided her both professionally and personally. Morse addressed multidisciplinary research and the importance of developing native health researchers to examine the issues related to indigenous people.

In conjunction with the research conference was the first Native Health Careers Student Development Conference and Career Fair.

The annual American Indian Health Research Conference is sponsored by the North Dakota IDEa Network of Biomedical Research Excellence and the University of North Dakota School of Medicine and Health Sciences Center for Rural Health.



Center for Rural Health to establish new Native elder program

The Center for Rural Health (CRH) at The University of North Dakota School of Medicine and Health Sciences has received funding to create the National Indigenous Elder Justice Initiative (NIEJI).

Funded by the Administration on Aging, NIEJI will focus on resources to prevent and address Native American elder abuse by developing model policy and codes for tribal law, providing resources to address identifying and intervening in elder abuse, and providing information on the exploitation of the elderly in indigenous communities.

In addition to providing resources, NIEJI will develop model plans for reporting, investigating, and intervening in indigenous elder abuse cases that involve authorities across tribal, state, and federal jurisdictions.

Dr. Jacque Gray, director of NIEJI, said, "The National Indigenous Elder Justice Initiative will address a cavernous gap that exists for indigenous elders. Because the investigations cross tribal, state, and sometimes federal boundaries, there are many obstacles. NIEJI hopes that by providing model codes for tribal governments and processes for investigation and intervention our native elders can be protected and honored in a way that preserves their dignity."

The National Indigenous Elder Justice Initiative will establish a website, a toll free phone number, and other resources to assist Native elders.

UND and NDSU host statewide undergraduate research symposium

The 2011 North Dakota INBRE Annual Symposium for Undergraduate Research was held Thursday, Oct. 27, at the Alerus Center in Grand Forks. The focus of the symposium was "Environmental Research in North Dakota." Health and the environment were the focuses of research conducted under the North Dakota IDeA Networks for Biomedical Research Excellence (INBRE) program, which lends significant financial support to research projects at predominantly undergraduate institutions in the state. Information about the INBRE program can be found at <http://ndinbre.org/>.

The Institutional Development Awards (IDeA) program under the National Institutes of Health's (NIH) National Center for Research Resources assists states such as North Dakota that have historically received proportionately less research funding from the NIH than larger states. The objective is to develop an infrastructure that supports biomedical research, creates opportunities for students to pursue careers in biomedical research, and assists researchers in becoming more competitive for NIH funding.

The symposium featured research presentations by faculty and a poster session that highlighted research by

undergraduates from participating institutions: Dickinson State, Minot State, Mayville State, Valley City State, Cankdeska Cikana Community College, Turtle Mountain Community College, the University of North Dakota and North Dakota State University.

The statewide INBRE network is administered by the University of North Dakota (UND) School of Medicine and Health Sciences in collaboration with North Dakota State University. Donald Sens, PhD, a professor in the Department of Pathology at the University of North Dakota School of Medicine and Health Sciences runs the program at UND, and Donald Schwert, PhD, a distinguished professor of geology and director of the Center for Science and Mathematics at North Dakota State University, serves as the program coordinator there.

Don't eat your camelina: Save it for biofuel and pharmaceuticals



Researcher Eric Murphy, PhD, would prefer that you don't eat your camelina, which is a cousin to cabbage and brussels sprouts. He has better uses for it as a biofuel and much more. Murphy is a tenured associate professor in the Department of Pharmacology, Physiology and Therapeutics at the University of North Dakota School of

Medicine and Health Sciences.

"Camelina-derived vegetable oil is a key emerging biofuel feedstock for next-generation biofuels and for traditional renewable biodiesel markets," said Murphy in the November–December issue of *Inform*, the research journal of the American Oil Chemists' Society. "The estimated demand for fuel for the aviation sector in the United States alone is 17 billion gallons per year, while the worldwide renewable diesel market is more than 2 billion gallons per year. To meet these demands, it is critical to have a vegetable oil that can be produced economically on a large scale without any government subsidy."

And don't worry; you probably won't ever have to eat your camelina because it isn't a food crop in the United States. But camelina is a versatile plant and an excellent source of oil for biofuels. It can produce high yields while growing on marginal lands with minimal chemical inputs.



Camelina can be grown in areas that won't displace traditional food crops from fertile land—a factor that weighs against corn, soybeans, and canola as sources for biofuels because their use reduces the acreage dedicated to food production, leading to higher food prices. In addition, biofuels production from camelina provides a residual high-protein, high-energy meal for livestock.

For more than 3,000 years, camelina has been cultivated in Europe, where the Romans used it for lamp oil and to feed livestock. "Modern camelina production has been limited to Eastern Europe and Finland, where the oil is niche-marketed as healthful edible oil," Murphy said.

But he hopes to expand camelina production in the United States. Murphy is not only a recognized research scientist but is also the scientific officer and executive vice president for research and development for Agragen LLC, a Cincinnati-based biotechnology company that through the work of a sister company has developed a variety of livestock feeds from the substantial byproduct of camelina biofuel production. However, Agragen's main purpose is to develop plant-made pharmaceuticals from camelina.

"Although camelina is the future of fuel, it may very well be the future of biological pharmaceutical production," Murphy said.

UND undergraduates garner research awards

UND undergraduate students were recognized for their research accomplishments at the 9th Annual American Indian Health Research Conference and 2011 North Dakota INBRE Annual Symposium for Undergraduate Research held October 27–29 in Grand Forks. Three students won Alan J. Allery Undergraduate American Indian Health Researcher of Promise awards:

- Bethany Davis, Turtle Mountain Chippewa, senior biology major and psychology/deaf studies minor, for her presentation titled "Alpha-1A Adrenergic Receptor Stimulation Improves Mood in Mice." Davis' mentor is Dr. Van Doze in the Department of Pharmacology, Physiology and Therapeutics.
- Sarita Eastman, Sisseton-Wahpeton Oyate, senior psychology major, for her presentation titled "Spirituality as a Protective Factor in American Indian Mental Health." Eastman's mentor is Dr. Jacque Gray in the Center for Rural Health.
- Melissa Wheeler, Diné from the Navajo Nation, senior psychology major, for her presentation titled "Alcohol and Other Drug Use among Northern Plains Indians." Her poster had also been previously selected as Outstanding Poster by Psychologists in Indian Country at the American Psychological Association conference in Washington, D.C., in August. Wheeler's mentor is Dr. Jacque Gray in the Center for Rural Health.

Two UND undergraduates were recognized at the 7th Annual Undergraduate Research in the Molecular Sciences meeting held October 29 at Minnesota State University–Moorhead:

- Erin Holdman, senior medical laboratory science major from Kenora, Ontario, received a \$400 travel award to present her work at the 2012 Annual Meeting of the American Society for Biochemistry and Molecular Biology in San Diego, Calif., for her presentation titled "Structural Analysis of Immuno-enriched FAM129b from Rat Lung Tissue." Holdman's mentor is Dr. John Shabb in the Department of Biochemistry and Molecular Biology.
- Joshua Maliske, senior biology major from Bismarck, N.D., also received a \$400 travel award to present his work at the 2012 Annual Meeting of the American Society for Biochemistry and Molecular Biology in San Diego, Calif., for his presentation titled "'TRPC1-STIM1-Orai1' is the Core SOCE Complex in Proliferating Mesenchymal Stem Cells." Maliske's mentors are Drs. Brij Singh and Joyce Ohm in the Department of Biochemistry and Molecular Biology.

FOCUS on Providers

is a listing of communities in North Dakota with current openings for all specialties.

<http://bit.ly/vug6Bf>



Interprofessional Health Care Education

By Juan Pedraza

American health care's greatest challenge is cost.

Expenditures in the United States on health care are closing in on \$3 trillion, more than 10 times what they were in 1980, and the equivalent of about \$8,000 per resident annually. Soon health care spending will account for 20 percent of the economy (see this Kaiser survey <http://www.kaiseredu.org/>).

Stanching the flow of cash into health care is a major national concern, clearly understood by health care professionals at the University of North Dakota School of Medicine and Health Sciences and others in disciplines related to health care across campus.

One positive step in that direction is the School's Interprofessional Health Care Course (IPHC), an integrative program launched under the tenure of former UND SMHS Dean Dr. David Wilson.

The course, codirected by Eric L. Johnson, MD, assistant professor, and Maridee Shogren, MSN, of the UND College of Nursing, involves every allied health profession on campus and is run on a collaborative model that doesn't assign a "higher" value to any one profession or specialty over any other.

"We want this course to provide the students with an opportunity to develop their own professional roles and their functions as members of a health care delivery team," said Johnson, a board-certified family practitioner.

The IPHC is modeled on the School's acclaimed patient-centered



learning (PCL) small-group curriculum.

The focus of the course is to learn about the role of other health care professionals and how to interact as a health care team. Eight disciplines are involved in the course: medicine, nursing, occupational therapy, physical therapy, music therapy, communication sciences and disorders, social work, and nutrition and dietetics. Each semester, two six-week sessions are held on Tuesday evenings from 5:30 p.m. to 8:30 p.m.

The small groups consist of seven to nine students from the various disciplines and meet in rooms across campus. The course is offered pass or fail.

"Teamwork is essential in health care because it leads to a much more collaborative and holistic approach to patient care," Johnson said. "Thus we want students from each health care profession to learn what the role of others on the team is."

This approach is intercultural—one might say revolutionary—in medical and health care education. In "traditional" health professions education, specialists from one area—such as medicine—know very little about areas outside their training—such as physical therapy or nutrition and dietetics.

"Our approach with this course helps health care professionals learn from each other," Johnson said. "The result: improved patient outcomes." And that, he noted, leads to a much more cost-effective health care system.

"This kind of team-based approach works especially well for chronic diseases, such as diabetes," said Johnson. "I know this because I was diagnosed with Type I diabetes when I was 29. Patients with diseases such as mine are much better served by a team approach that includes a range of medical professionals: physicians, diabetes educators, dietitians, et al."

For example, he notes, the value of the team approach in treating diabetes results from the rapidly evolving technology of diagnosis and long-term treatment of this chronic—and so far incurable—disease.

"Diabetes technology changes so fast, such as glucose monitors, that usually the only folks who can keep up with those changes are the diabetes professionals—they're equipped to keep up with those changes, and they can then share that knowledge with care team partners," Johnson said. "So diabetes care teams that have diabetes educators are ahead because of their interprofessional approach."

From direct medical care, there's a natural segue into other team-related approaches to helping a patient manage a disease such as diabetes.

"Teams can do a lot of other things, such as help support groups, hold patient education events, and organize things like diabetes conferences," Johnson said.


Insurance companies have an eye on the team-based approach, which insurers interpret with a view to the future.

"Insurers are definitely getting behind this kind of case management strategy," Johnson said. "Many third-party payers—

insurance companies—pay for group visits such as diabetic and cardiac where they didn't before.

Medicare also encourages group visits, especially for folks with diseases such as Type II diabetes."

"Team members that represent each department are



The
interprofessional
health care course
features **students
from a variety of
disciplines,**
including nutrition,
nursing, medicine,
music therapy,
physical therapy,
occupational
therapy, social work
and communication
disorders.



Eric Johnson



Gwen Halaas



Maridee Shogren



Andrew Knight

outstanding to work with," Johnson said. "They are in frequent e-mail contact with each other, and the class is so well constructed that it really makes it easier, going forward. It's not like we're doing periodic updates—we're constantly updating and refining."

Financing the IPHC

Originally the lion's share of the Interprofessional Health Care Course budget fell on the SMHS.

"But we developed a relatively simple formula—a budget mechanism—based on a proportional system," Johnson said. "Each department that participates pays according to its share of total participation in the program; we will start doing that soon."

Accreditation for the course is not that complicated, Johnson noted.

"We demonstrate that we have some interprofessional education component—some universities do more, some less—and our approach is more formalized than many," Johnson said. "Some schools only schedule a few interprofessional lecture seminars per year. And on our team, every department involved has a voice—it's a very democratic process."

The UND College of Nursing is a major player in the IPHC, Johnson noted.

"You bet," said Maridee Shogren, MSN, a clinical instructor in the college and co-team leader of the course.

Each small group is led by a preceptor, a faculty member from one of the various health professions taught at UND.

"Preceptors facilitate and lead students through the process, but the students have to work the case themselves," said Shogren. "One thing we all learn is that every person on a team is a patient advocate. We believe that significantly reduces errors in the health care system. The team approach tends to do that better, and that's likely to improve cost efficiency, too, and that's an appropriately important issue for the twenty-first century."

"So with the team approach, each member notes a responsibility to both

other members and to the patient," Shogren said. "So we're not engaged in 'handing off' care from one professional to another. Unlike the stereotype of medical care, we don't keep people in a box, we share information and ideas. We want everyone on the team to bring all of their expertise and experience to the table—it's all about respectful communication."

For Gwen Halaas, MD, MBA, a family physician and senior associate dean for academic and faculty affairs, the Interprofessional Health Care Course is integral to the philosophy of health care education at the UND School of Medicine and Health Sciences and its allied health partners across campus, such as the College of Nursing and the Department of Social Work.

Halaas has seen a lot over her career as a physician, health system administrator, and educator that inspires her views on interprofessional education.

A graduate of Concordia College, Moorhead, and Harvard Medical School, she's done just about everything a family physician can do and then some, including delivering babies, making house calls, and writing several acclaimed books. She was previously director of the Rural Physician Associate Program and was the founding director of the Center for Interprofessional Education at the University of Minnesota.

"Interprofessional means across the health professions," Halaas said. "Historically, I would say that health care in America is multiprofessional, which means we work with other health professionals, but only in a serial manner—we receive and refer, but we rarely function as a team. It's more of a handoff."

But that's changing.

"The interprofessional movement—which includes what we're doing here at UND—is toward collaborative practice; it includes pharmacists, nurse practitioners, social workers, and people in the therapies such as

occupational and physical,” Halaas said. “As a result of this trend, the potential for the improvement of our health care system is tremendous. There already are pockets of interprofessional practice, for example, pediatrics groups working with kids with disabilities or chronic diseases, and hospice care, but we need to do a lot more of that.”

The team is most effective when the individual patient is a member of that team.

“Self-care and patient self-management are important for good health and better outcomes,” said Halaas, who got an inside track on the system within the group she founded at Minnesota. “Working with

Playing the right kind of music

“We’re a lot like King Arthur’s Round Table,” said Andrew Knight associate professor and director of the UND Music Therapy Program and a preceptor in the Interprofessional Health Care Course.

“There is one of us at the table from each of the medical and health care-related professions on campus,” said Knight. “As course preceptors we do a lot of probing, prompting, relying on our experience, to help students get the full benefit of the course. We ask them questions like ‘Did you think about this aspect of the case?’”

Knight said it’s a lot different than teaching other classes, which require a

...it helps to develop very specific communications skills and tools to prevent errors.

Eighty percent of errors in medicine are communication errors.

interprofessional education at Minnesota was a terrific experience for me. Being responsible for the development of interprofessional education programs, I recognized the challenges as well as the value, and I networked with national and international leaders in interprofessional education.”

Halaas said team-based competencies—such as those shared by an interprofessional health care delivery group—build a shared foundation of useful and applicable knowledge.

“The important thing about interprofessional teams is that the teamwork is visible,” Halaas said. “That means team members, actively communicating with each other, always include the patient. Ultimately this is about both safety and quality in medicine—it helps to develop very specific communications skills and tools to prevent errors. Eighty percent of errors in medicine are communication errors.”

“Our post-course satisfaction survey indicates that students tend to be very happy with the course; they find it very useful,” Halaas said.

To date, UND’s Interprofessional Health Care Course has had about 1,700 students.

more formalized preparation, such as course notes.

“Compared with teaching a regular class, there’s a lot more spur-of-the-moment stuff in the Interprofessional Health Care Course,” Knight said.

“We actively try to get students to participate, to compare stories, to learn from each other’s experiences,” said Knight, an accomplished performer on several instruments, including guitar and piano. “I actually take the case-based learning models we use in IPHC into my music therapy and other music classes.”

In the IPHC case-based learning model, there isn’t always a clear answer to the specific scenario under discussion.

“How do you take an imperfect scenario and come up with reasonable answers?” Knight asked. “Well, they’ve been doing this a long time at the medical school, especially with these interprofessional courses, and I think it’s a great addition to Music Therapy.”

“Of course our perspective as music therapists is good for students in other areas of health care,” Knight said. “We each get to know clients in different ways, sort of like the blind men and the elephant.”



Epigenetics

By Juan Pedraza

How factors outside our genes affect who we are.



Joyce Ohm

Grandma's favorite snacks while she was pregnant with your mom may explain many things: why you crave chocolate, why you hate seafood, or why your bathroom scale reads "overweight."

And if your grandmother lived on a farm during the Dirty Thirties, coping with drought, economic distress, and social uncertainty, scientists see more explanations for who you are and why you do what you do.

In a nutshell, says UND School of Medicine and Health Sciences cancer expert Dr. Joyce Ohm, that's the process of epigenetics, the complex and richly fascinating science of how environment and grandparents' behavior—sometimes things that happened long before we were born—affect the way our genes express themselves.

That epigenetically influenced expression, notes Ohm, assistant professor in the Department of Biochemistry and Molecular Biology, can partly explain how our bodies behave,

what diseases we get, and how we respond to treatments. Epigenetics can also explain scientific mysteries such as why two identical twins—often the epitome of genetic similarity—can get more and more different as they age.

The core challenge is in the word *partly*. While epigenetics—a relatively new science—can help scientists understand some of the physiological mechanisms underlying diseases and other body problems, it can't explain everything. So the questions are, which parts and how much can it explain.

That's what Ohm and several other researchers at UND are trying to figure out. It's really all about another road to travel on the way to curing or preventing some of our worst scourges—many chronic and so far incurable diseases such as Alzheimer's, Crohn's, Parkinson's, and diabetes.

"When I decided to pursue science as a career, I wanted to find the causes and cures, and how cells worked in those processes," said Ohm, who got her PhD in cancer biology from Vanderbilt University, where she focused on the cellular mechanisms behind cancer. "I became interested in how tumors evade the body's immune system, and that got me very interested in stem cell biology and vascular endothelial growth factor (VEGF)."

"It's a 'stealth' environment because our immune system can't 'see' tumor cells," Ohm said. "As a post-doctoral scholar I jumped into something really new but related to what I was working on—I went to work with Dr. Stephen Baylin at Johns Hopkins University in Baltimore; he's considered the 'father' of epigenetics."

Ohm explains the term epigenetics this way: gene expression, traditionally thought of as dependent only on our DNA sequence, is affected by factors outside that little package of instructions

that comes in every cell in our body (the package that determines the color of our eyes or whether a particular cell becomes heart muscles or thigh bone).

"If our genes are the hardware that we inherit, epigenetics represents the software that we use to program those genes," Ohm said.

That "outside" part is what gives the science its name; "epi" is a Greek prefix that means over, above, or outer, hence epigenetics.

"Examples of such changes in gene expression include DNA methylation and histone deacetylation," Ohm said. "Both of these processes can change or suppress the expression of a particular gene without changing the actual DNA, yet these epigenetics marks can be inherited from cell to cell and from generation to generation."

Thus the core mystery of epigenetics: how does this process work? It's the question at the heart of the research being done at UND by Ohm and colleagues including Dr. Barry Milavetz, professor of biochemistry and molecular biology, a virus expert who also is associate vice president of research. He heads up the research division's office of research development and compliance.

"My lab has now circled back around the stem cell work I did as a graduate student, which we have found may play a key role in cancer epigenetics," Ohm said. "Epigenetics plays a crucial role in abnormal changes, such as in cancer, where the body has lost the control at a given point in time."

The biggest problem from the point of view of both scientist and patient is that there isn't a specific way to pinpoint what's going on—cancer detection still is a guessing game until you actually see the cancer.

"What's happened in the last decade, which is my scientific life, is a major shift in how we think about cancer," Ohm said. "We used to think about cancer this way: surgery, chemotherapy, radiation. We treated cancer as a single entity. Now—partly because of the science of

epigenetics—we realize that cancers are as individual as the patients are. And they can have very unique individual changes."

For example—in the context of epigenetics—you can have twin sisters who both develop breast cancer.

"However, those cancers could be completely different," Ohm said. "We're starting to understand the individual nature of cancer. Different types of cancers show up differently from one individual to another. One of the characteristics is the stem cell phenotype, such as pancreatic cancer, melanomas, and really aggressive cancers such as small-cell lung cancer and triple-negative breast cancer [a breast cancer that doesn't express the three common markers found in most breast cancers]."

Many of these exceptionally aggressive cancers have developed stem cell characteristics.

"Stem cells have really unique characteristics, they can divide extensively, they can move through the body, and they can migrate to different sites," Ohm said. "Those are things that also are true for cancers."

That similarity is also why there's a huge risk in stem cell therapies, which so many folks look to for "miracle" cancer cures.

"One of my most recent papers investigated the potential cancer risks associated with induced pluripotent stem cells, commonly abbreviated as IS cells or iPSCs," Ohm said.

Pluripotent stem cells have been touted as powerful tools in the regenerative medicine field.

"But they are made by 'forcing' the expression of specific genes that are also known to play a role in tumor formation," Ohm said. "Researchers are trying to figure out how to reprogram an iPS cell back into a stem cell state so they can be used to treat disease or regenerate tissues. We are interested in making sure that process is safe in terms of both cancer risk and reprogramming of the epigenome."

"We know that the body is constantly trying to repair

Epigenetic Research Using Viruses

Barry Milavetz explores the role of epigenetics in his study of viruses.

By Juan Pedraza

Barry Milavetz, PhD, professor of biochemistry and molecular biology, joined the UND School of Medicine and Health Sciences' faculty in 1986 and was appointed the associate vice president for research in charge of research development and compliance in 2004.

He has spent several years working on epigenetic research using viruses.

"Simply stated, viruses are genetic information packaged in a protein coat," said Milavetz, whose day job keeps him close to Twamley Hall, the hub of UND's administration. But

he treks regularly back and forth to his lab in the UND School of Medicine and Health Sciences. He is often found working in his laboratory well past office hours, late into the night.

"Viruses, which are all parasites that can't live without a host cell, may contain external structures and a membrane," said Milavetz, who has a grant from the National Institutes of Health for this research and is writing another one to extend the research. "They come in all shapes and sizes: polio, influenza, herpes, smallpox, chickenpox, and human

itself," Ohm said. "It senses damage and can regenerate its own tissue; 99.9 percent of the time the body takes care of mistakes perfectly, but sometimes, it doesn't—that's just bad luck. Also, the ability to repair tissues declines as we age."

It adds up, in the case of cancer, to the biggest challenge in today's medicine: how to detect cancer—any cancer—before it becomes a problem.

"I'm interested in where those earliest epigenetic problems are coming from," Ohm said. "Where does that first tumor cell come from? What went wrong, and what went wrong first to trigger this process?"

Scientists and physicians alike know what cancer looks like—usually because it's there in front of them.

"We know what it looks like at the end, and we know what the epigenetic changes are in cancer, but looking to how they started can be a challenge," she said. "In a human cancer, you may be talking about 10 years or more after the first cancer cell developed before we actually find that cancer. So when the physician first detects cancer, it actually could have started years previously."

Bottom line in terms of patients, Ohm noted, is that virtually all cancer, if caught early enough, can be treated, even cured.

But before that happens, scientists like Ohm, using tools that include the science of epigenetics, probe for answers to key questions: What triggers a cell to start dividing again? What triggers a cell to migrate to a new place?

"The cancers that we know about that are so horrible, so deadly, like pancreatic cancer, are deadly partly because they don't show symptoms until they're very far advanced," Ohm said. "We don't know what they look like in their very early stages. We just don't know what went wrong. I'm

looking for things that may trigger a cell to abnormally activate stem cell pathways."

Thus Ohm and her colleagues are focusing on environmental epigenetic factors.

"I'm looking at DNA damage models and environmental toxins and the kinds of things that have been implicated in cancer to see if we can see those earliest epigenetic changes happening," Ohm said. "I use a lot of cell culture models. In addition, we will move into animal work as

the project develops."

"We're using different environmental toxins, such as pesticides, endocrine disruptors, environmental solvents and plastics, things that have been implicated in cancer for years but we haven't really understood," Ohm said. "We work with a cell culture model where we extract DNA, extract RNA, look for gene expression changes and epigenetic changes such as DNA methylation."

DNA methylation, Ohm explained, is a normal process in our cells that's vital for normal development. Methylation helps the DNA do its work, which in turn helps each cell to "figure out" if it's supposed to be a heart muscle cell or part of your eye, etc.

"We also study chromatin changes and how the DNA is packaged," Ohm said. Chromatin is a protein package that helps the DNA molecule fit into each individual cell. Chromatin is the orchestra leader that tells DNA when to start dividing to form new cells, and it helps to prevent DNA damage. Chromatin also controls gene expression—so if it's damaged by, say, epigenetic factors, things can go terribly wrong when it's time to replicate.

"You have miles of DNA in each of your cells," Ohm

immunodeficiency virus (HIV), which causes the acquired immune deficiency syndrome, or AIDS."

"Because viruses can multiply only inside the cells they infect, they are not considered to be alive," said Milavetz, who obtained his PhD in Organic Chemistry at the University of Illinois, Urbana-Champaign, and a bachelor's degree in chemistry from the University of Minnesota.

Milavetz's research interests include the molecular biology of simian virus 40 (SV40), the study of chromatin architecture, and regulation of eukaryotic gene expression—and he figures that epigenetics plays a role across all of these research fronts.

"Epigenetics is about the role that the environment plays in regulating gene expression, and we now know that this is transgenerational," Milavetz said. "We know that environmentally influenced information—such as whether your grandmother lived through a severe famine—can

actually be transmitted from one cell to another, one generation to another—and we are really trying to understand how all this happens."

"We make what are really neat observations: for example, nature (genes) and nurture (environment) both have an effect, and through multiple generations, you are influenced by the lifestyle choices of your parents and also that of your grandparents."

"I work with virus system SV40," Milavetz said. "We use it as a model to understand in general how eukaryotic cells—humans are made up of these types of cells—control epigenetic information and how certain classes of viruses use epigenetics in their lifecycles. What we find is that viruses transfer epigenetic information from generation to generation."

"Growing in a cell, a virus divides to infect new cells; the virus from the first cell contains epigenetic information

**Now - partly because of the science
of epigenetics -
we realize that cancers are as individual
as the patients...**

said. "Therefore, it's got to be folded up carefully to be stored, and the way that's done is through chromatin; it's the packaging. You can imagine if you package something up tightly, it's a lot harder to access it, but if you package it loosely so that the transcription factors can see those genes, those are the genes that are going to be more active."

So far we've focused on Dr. Ohm—but she's not working in isolation. Far from it.

"There's been a real push for the appreciation for collaborative science in recent years," Ohm said. "Many scientists work in isolation, lock themselves in the lab, and do science. That's not the best way to do science. One of the things I loved most about UND is that everyone here works in a very open, exciting, collaborative fashion."

And that's precisely what the science of epigenetics demands. At UND, an epigenetics working group is growing quickly.

"Epigenetics probably plays a role in every human disease," Ohm said. "So everyone here has been very excited to work as a team."

"Right now I am one of the epigeneticists on campus, and Dr. Barry Milavetz is another," Ohm said. "He works on viral genomes—a lot of that translates into humans. Two new faculty hires will be joining us in January, Dr. Archana Dhasarathy and Dr. Sergei Nechaev. Both work within the field of epigenetics, and they join us with extensive training from two premier epigenetics laboratories at the National Institute of Environmental Health Sciences."

Research at the UND College of Nursing is a vital part of the epigenetics equation.

"We have a really nice collaboration with Dr. Cindy

Anderson in Nursing, who studies pre-eclampsia—that's hypertension, high blood pressure—that develops during pregnancy," Ohm said. "It is a fascinating phenomenon where women who develop pre-eclampsia tend to give birth to female offspring who themselves develop pre-eclampsia and cardiovascular disease later on in life," Ohm said. "It keeps going in grandchildren; epigenetics may be responsible for that. So we're studying epigenetic patterns of inheritance."

Which brings us back to this story's opener: "What your grandmother ate while pregnant with your mother may have affected how you process sugar and your risk of obesity and diabetes," Ohm said.

"It's called transgenerational inheritance—epigenetic inheritance," Ohm said.

For years, people thought that it was all happening with genetics, that all of your problems came from problems in your DNA.

"What we know now is that changes in how you read your DNA can cause all kinds of disease states, and they can be passed down from parent to offspring," Ohm said. "And these epigenetic changes may be responsible for all these diseases that don't have easy genetic explanations: obesity, diabetes, autoimmune disease, addiction, neurodegeneration. We have researchers in the epigenetics group who are investigating the epigenetic components of each of these diseases or disorders. We know, for example, that obesity runs in families; we just don't know how."

"Oh, there's plenty of research yet to be done on this," Ohm said.

such as viral infection information and transfers it to the next cell," Milavetz said.

How does the environment define the epigenetic code and how does this code work in concert with the genetic code inherited from your ancestors?

"This is still relatively a very new science," Milavetz said. "We're doing two things mainly: we are mapping the epigenetic information and correlating it to regulation of biological function." Once this relationship has been defined, the potential for the manipulation of epigenetic information in the treatment of diseases such as cancer and neurological disorders will be staggering.

"It turns out that in eukaryotic cells, all DNA is bound to proteins called histones, which are easily modified by acetylation, methylation, and phosphorylation," Milavetz said. "Our initial work was to study the histone acetylation pattern and link it to viral gene expression. We are now expanding our work to characterize histone methylation

mainly because it's inheritable. What we see is that it's not a matter of a unique modification having a specific biological effect; it's the patterns of modifications relative to aspects of infection that are significant. These changes show up in virus particles, and subsequently show as biological changes in the next infection of cells; what we call epi-phenotypes."

It boils down to a lot of work in a dense thicket of information to pry loose a detail or two that makes sense. "We've been trying to divide infections into various stages, and we look at how epigenetics plays a role in each of those stages," Milavetz said. "Sure, a lot of what we see is difficult to interpret at this point, but we are trying to understand our results and put it into the context of regulation, and this is what motivates us to pursue this fascinating area of biology."

The good news in this era of federal budget cuts and national fiscal austerity is that the NIH has put epigenetics on its research roadmap.

What your grandmother ate while pregnant with your mother may have affected how you process sugar and your risk of obesity and diabetes.

TruServe:

The CRH's homegrown system helps non-profit organizations improve performance.

By Kristine Henke

TruServe is a web-based tracking system that allows **non-profit organizations to show what they are doing** on a day-to-day basis.

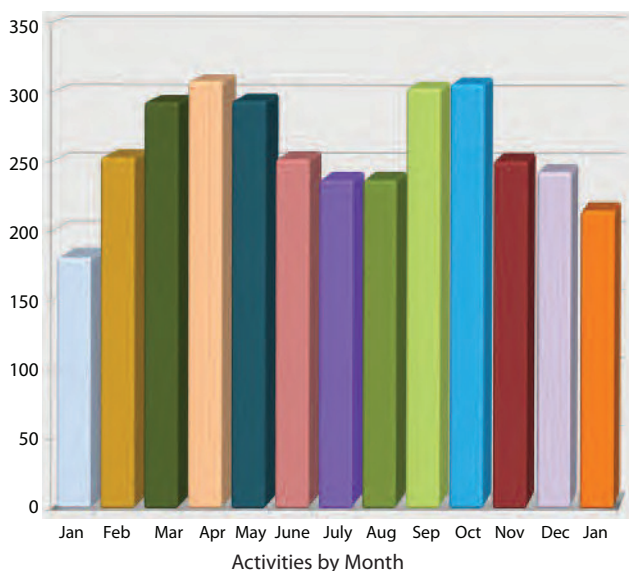
It's no secret—budgetary times are tough. Federal, state, and local budgets are being trimmed. Among many things, the budgetary environment we are living in can seem to foretell a precarious future for non-profit agencies. Those working for causes that are important to the well-being of our communities, states, and country can feel the threat of losing dollars. One thing non-profit organizations can do to combat this pressure is recognize that this new environment requires them to emphasize accountability, reliability, and responsiveness. In order to do this, agencies need the ability to establish what they have done and establish the effect of their actions. To assist in this matter, the Center for Rural Health (CRH) has created a product: TruServe.

TruServe is a web-based tracking system that allows non-profit organizations to show what they are doing on a day-to-day basis. The Center for Rural Health, a non-profit organization within the University of North Dakota's School of Medicine and Health Sciences, is highly reliant on grant-funding. So, TruServe was created

to track outcomes of the work the CRH does. TruServe strengthens an organization's ability to collect measurable outcomes so that organization can establish the effect its programs have, furthering greater understanding of the effect of the funds used for those programs. TruServe collects program data to facilitate planning, information dissemination, program reports, resource allocation, and staffing. The current environment for virtually all organizations is one that emphasizes organizational performance. Data collection and measurement are elements used to determine performance.

TruServe works only as well as the information its users enter into it. Users can enter technical assistance they provided, a meeting they held, a presentation they gave, or any other number of tasks they have completed. They enter what the activity was, when it was held, the location, a short description about the encounter, the amount of time associated with the activity, and some other identifying information. For example, a user could enter a technical assistance call they had concerning a community needs assessment. They could enter whom they talked to, what organization that person is with, what grant the assistance correlates to, and what information they provided to that person. This provides evidence of the effect of effort. Additionally, it provides both a reliable database and one that allows an organization to develop a consistent and rational means to measure and report performance.

Once the information is in the system, the true magic can happen. All information entered into TruServe is able to be used in a variety of ways by any of its users. The strength of TruServe is the program's ability to take entered information and use it to create

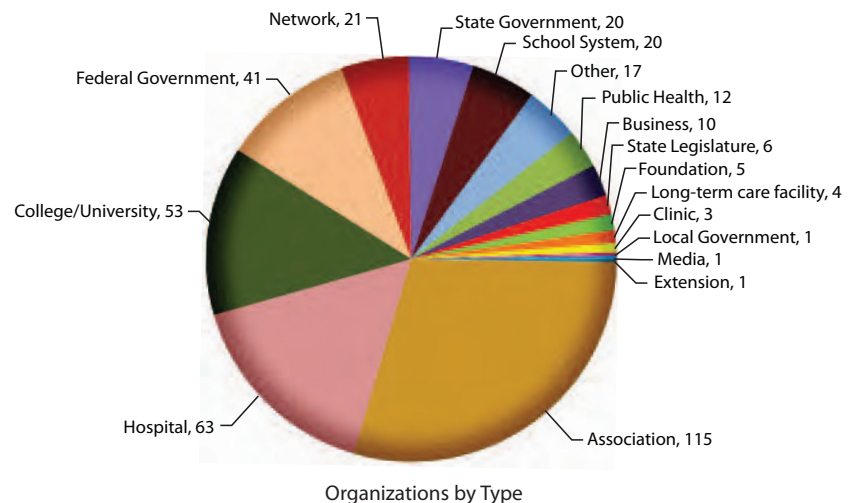


reports and maps at the click of a button. When an activity is captured in the system, you can run a report on any piece of information you have entered. If you wanted to show all the times the Center for Rural Health has worked with Watford City, N.D., for example, you could do that. If you wanted to show how the CRH interacted with Watford City with only one or two specific grants, you could do that too. The reporting and mapping section is the most robust because the reports and maps are fully customizable. If an organization wants to show how it affected a state, it can do that visually, which can be very powerful. The development of TruServe came out of the realization people have had over the past few years of the need for a system that can quantify, display, and disseminate organizational performance findings in a useable and presentable format. There were a few other State Offices of Rural Health who heard about the Center's system and wanted to review its technology process. The Center knew there was a need for similar organizations to be able to capture what they are doing and use that information to show a variety of things about their organization. Currently, the Center for Rural Health has a partnership with the National Organization of State Offices of Rural Health that allows them to offer TruServe to all 50 State Offices of Rural Health. Knowing the importance of

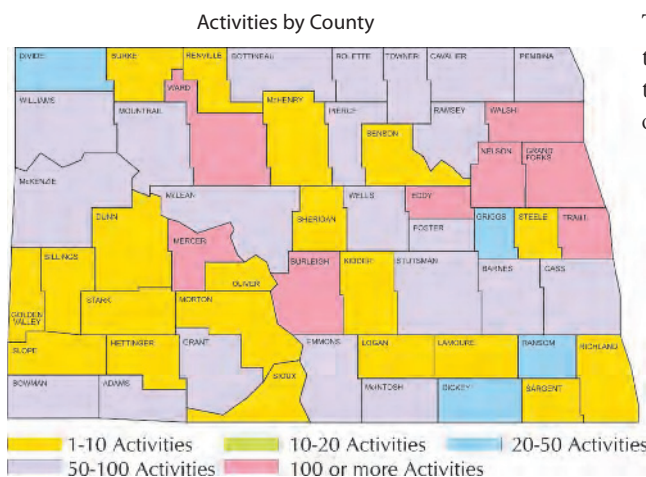
If an organization wants to show **how it affected a state**, it can do that visually, which can be very powerful.

being able to show funders, stakeholders, policymakers, and others what is being done with those precious grant dollars, the CRH is looking to keep expanding TruServe with the help of the University of North Dakota's intellectual property office. By using TruServe, organizations worried about crunching budgets and showing the need for their cause can worry less, save time, and show results in this tight budgetary environment.

For more information about TruServe, visit <http://bit.ly/tdRTUB>.



Organizations by Type



The TruServe software graphs data into chart form, shown by the three examples on pages 18 and 19. Non-profit organizations can use this information to improve performance and to demonstrate their organization's effectiveness.

World-renowned scientists gather for first-ever biomedical research retreat

By Catherine Brissette, PhD, Jamie Foster, PhD, Keith Henry, PhD, and Joyce Ohm, PhD

The University of North Dakota School of Medicine and Health Sciences took a huge step toward "Building Bridges" with its Interdisciplinary Biomedical Research Retreat, held on October 27 in Grand Forks. This special event was organized by a team of assistant professors led by Drs. Catherine Brissette, Jamie Foster, Keith Henry, and Joyce Ohm.

The event brought together over 125 members of the local scientific community, including graduate students, post-doctoral fellows, faculty, administration, and staff. The goal was to build bridges between disciplines and to foster an integrative approach to the advancement of biomedical research in North Dakota.

The retreat featured two outstanding speakers. Paul Sanberg, PhD, DSc, Distinguished University Professor and associate vice president for Research and Innovation at the University of South Florida College of Medicine, spoke about "Early Drug Discovery to the Marketplace: One Inventor's Story and the National Academy of Inventors." Dr. Sanberg

deftly illustrated how basic laboratory discoveries can translate into new treatments for devastating diseases. In an exciting development, Dr. Sanberg, who is also president of the National Academy of Inventors (NAI), invited the University of North Dakota and the School of Medicine and Health Sciences to join the NAI as a charter member institution! The mission of NAI is to honor academic invention by recognizing and encouraging inventors. This membership will enhance the visibility of technology and innovation at UND and help encourage and mentor innovative students.

The second talk was given by Lawrence Tabak, DDS, PhD, of the National Institutes of Health (NIH). Dr. Tabak is the principal deputy director and the No. 2 administrator below NIH Director Francis Collins. Dr. Tabak addressed "Challenges and Opportunities in Biomedical Research: The View from NIH." He highlighted the current funding challenges that biomedical research is facing in this economic climate, and illustrated ways that NIH is helping individual



Paul Sanberg, PhD, DSc



Lawrence Tabak, DDS, PhD

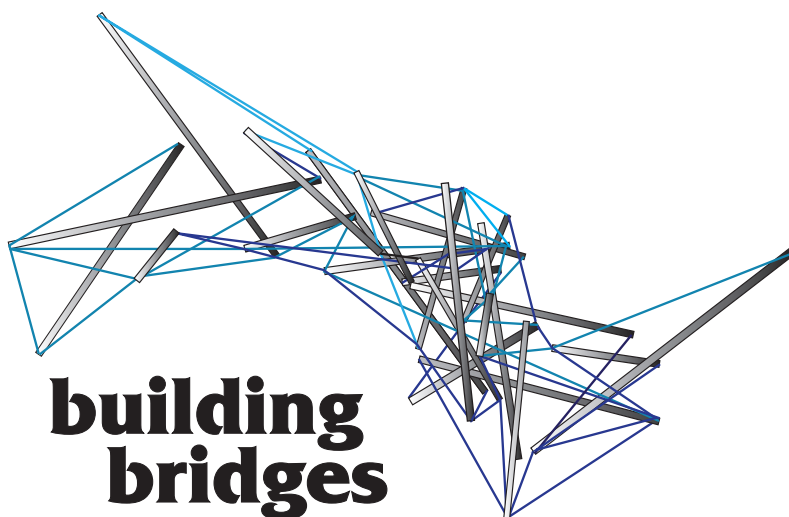


Pictured at the Research Retreat (from the left) are Jamie Foster, John Sladek, Dean Joshua Wynne, Joyce Ohm, Catherine Brissette, Paul Sanberg and Lawrence Tabak.

researchers and institutions meet these challenges—and succeed. Dr. Tabak generously spent an hour with the graduate students and post-doctoral scholars in an informal roundtable discussion. His openness and frankness were well appreciated by the trainees, who found him very approachable and engaging. He encouraged the students to seek out and contact their future program officers, and to learn more about how NIH works.

The day also included a rapid-fire data blitz, in which 30 investigators representing the basic science and clinical departments gave snapshots of their research. The retreat showcased the breadth and depth of biomedical research at UND. Special topic breakout groups were formed to address diverse questions regarding the research foci at the SMHS; an integrated graduate program; building bridges between basic, clinical, and translational research; and streamlining the grant submission process. The event concluded with a trivia game and a

relaxing social hour at the Canad Inn. Initial feedback has been very positive about the retreat, and the SMHS looks forward to many more opportunities to gather as we invigorate the flame of discovery at UND and build bridges toward a healthy North Dakota. 🌿



INTERDISCIPLINARY BIOMEDICAL RESEARCH RETREAT

FROM DISPATCHING BLACKHAWKS TO FLYING A STETHOSCOPE:

National Guard veteran says UND medical school is a terrific experience.

By Juan Pedraza

Jamie Lombardo,
National Guard veteran,
first-year medical student



Jamie Lombardo spent the better part of a decade dispatching Blackhawk and Chinook helicopters in places such as Montana and Iraq. In the war zone, when she wasn't communicating with chopper pilots, she was riding the birds for a firsthand look at the country she'd been deployed to just a few years out of high school.

"As a helicopter dispatcher, my responsibilities included organizing and tracking helicopter missions and serving as a liaison between the helicopter crews and the individuals they were working with as well as other aviators," said Lombardo, who was raised on a grain farm near Valier, Montana.

Today, Lombardo, commissioned as a second lieutenant in the Army, is dispatching lots of class notes, attending anatomy classes, and interviewing patients as part of her first year at the UND School of Medicine and Health Sciences on a full military scholarship.

Grand Forks is a maximum shift from her tour of duty in the Middle East. "When I got to Kuwait just prior to Iraq for training, I thought it looked like the surface of the moon," said Lombardo,

who joined the Guard when she was 17 and still in high school. "My mother was against it, but my dad signed the paperwork. (She laughs.) He was being pragmatic—it was a way to pay for college."

Education played a key part in Lombardo's decision-making all along.

"I graduated from high school in 2001 and then completed a surgical technology program at Montana State University College of Technology in Great Falls in 2004," said Lombardo. "I met my husband in the Guard in Helena in 2004. We got engaged prior to my deployment, so I planned our wedding while I was in Iraq."

Like many veterans of her generation who served in U.S. military operations overseas, she saw her share of action, though not direct combat.

"During my year at Camp Anaconda in Iraq, the base was mortared five times a day on average," Lombardo said. "The good news is that the base was very large so the mortars usually didn't hit anything. I only had a couple close calls while I was there."

None of that deterred her

commitment to her education.

"When the Air Force took over command of the base, they set up Internet access," Lombardo said. "This allowed me to start taking online classes through MSU–Billings in my spare time. And when I returned from my deployment, we moved to Billings, where I completed a biology degree with a chemistry minor in 2009."

The Lombardos shared that commitment to education.

"My husband got a history degree and a secondary education degree with a health minor also in 2009. Upon graduation, he was accepted to the Army Flight School in Fort Rucker, Alabama," Lombardo said. "I decided to get out of the Army at this point since I wanted to focus on getting into medical school."

Pursuing a medical education

"During our year in Alabama, I took the MCAT (medical college admission test) and spent time with our daughter Alivia while Jeremy became licensed to fly Blackhawks," Lombardo said. "He graduated in April this year, and we moved to Grand Forks because I had been accepted into the UND School of Medicine and Health Sciences. He now flies for the Guard unit in Bismarck."

"I had nine years of military service, and not wanting to let that time go to waste, I applied for the HPSP [Health Professions Scholarship Program] scholarship," Lombardo said. "This includes an automatic commission, a full scholarship, a monthly stipend of about \$2,000, and a sign-on bonus."

Upon graduation, Lombardo will be promoted to captain.

"You sign up with obligations in the summer while you're going to med school," Lombardo said. "You do some training the first summer, then sub-internships at VA and other military hospitals for the next three years, and when you're done with med school, you do residency at a military base. Then there's a four-year commitment to the Army after school. I intend to stay in for 11 years in order to receive military retirement."

It's a great experience

"So far I'm really enjoying medical school at UND," Lombardo said. "It's very challenging, but the faculty and staff are wonderful and

very supportive."

Lombardo is used to some important family firsts: no one else in her immediate family has done military service, and she's the first in her family to go to medical school.

Working with patients is an exciting part of UND's medical education, Lombardo notes.

"So far, I've interviewed patients and started practicing physical exams," Lombardo said. "Working with patients as soon as we do at this school is a great opportunity. I have friends who are in other medical schools, and they don't get that (early opportunity to work with patients)."

Next summer, Lombardo will work in a VA hospital—she doesn't know yet which one—as a sub-intern.

"I haven't chosen an area of practice or specialty," Lombardo said. "I really want to keep an open mind about it, experience a few different things. My parents and siblings are very enthusiastic about having a physician in the family. I'm loving my first year in medical school. It's going well, and I'm very busy—much busier than I ever was as an undergrad."



WEB EXCLUSIVE:
For more photos from
Jamie's deployment,
please visit:
www.ndmedicine.org



Jamie, Alivia and Jeremy Lombardo

Accident Turned Advocacy



The Mallberg Family (left to right): Bailey Riehl (12), Cora Riehl (14), Tessa Shaffer (8), Dan Riehl, Tracie Mallberg, Mason Shaffer (13), Tatum Shaffer (12), and Carson Shaffer (10).

By Jessica Sobolik

Dr. Tracie Mallberg, '02, turned her son's terrifying boat accident into a positive platform for head injury awareness throughout North Dakota.

A parent's worst nightmare is watching helplessly as his or her child is severely injured right in front of them. Unfortunately, Dr. Tracie Mallberg knows this to be all too true. "I saw the boat coming," she said. "There was no way to stop it."

Mallberg's son Tatum, 9, was on a tube behind his family's boat on Rose Lake on July 5, 2009, when he was struck by another boat. The events that unfolded after that moment were a blur, but Mallberg instinctively used her medical expertise to help first responders place a cervical collar around Tatum's neck and strap him to a

backboard. His injuries included a dislocated shoulder, punctured lung and fractured skull. "I don't think [the first responders] knew I was his mom," she said. "I was telling them he needed neck stabilization. I was shouting orders. He was posturing, vomiting, and I was calling for suction."

The ambulance took Tatum to Perham Memorial Hospital in Perham, Minn., where Mallberg could not help but direct the nurses to intubate him. From there, he was flown to Fargo, N.D. During the 27-minute trip, in which Mallberg was sitting in the jump seat, the crew turned off her headset when Tatum's blood pressure dropped. "I cried and prayed," she said. "That was the longest 27 minutes of my life."

Healing

Tatum remained in a coma for the next 13 days. When he awoke, he and his family began the difficult journey of recovery and healing. Mallberg's partner Dan and their other five children had been there at the time of the accident. Mallberg herself was guilt-ridden, wondering what might have happened if she'd reacted faster or done things differently.

After spending four months in the hospital, Tatum was finally allowed to go home. Mallberg hired a personal nurse to help. Halfway through the school year, Tatum was able to rejoin his third-grade class in West Fargo, N.D., but his head trauma presented challenges. "He had a lot of fatigue and tolerance issues," Mallberg said. "When he had too much, [the nurse] would take him home."

It became clear that the public school system was not prepared to work with a student like Tatum. There were no individualized education plans (IEPs) for students suffering from head trauma. Thus, Mallberg took it upon herself to help North Dakota develop a series of guidelines that would help. In doing so, she has become an unofficial advocate for children suffering from head trauma.

Advocacy

"There are no guidelines for working with students like my son," Mallberg reiterated. "I can't imagine how people without my medical background manage." She started looking for resources and found Rebecca Quinn, a social worker and traumatic brain injury (TBI) program director at the Center for Rural Health at the UND School of Medicine and Health Sciences in Grand Forks, N.D., who came to West Fargo to educate the school district about head trauma.

About a year after Tatum's accident, Mallberg learned about the Head Injury Association of North Dakota, along with legislation the association had proposed for the 2011 biennium to fund programs to support people suffering from head trauma. She

ended up testifying in front of the North Dakota Legislature in support of Senate Bill 2163. Introduced by Sens. Dick Dever, Judy Lee, and Tim Mathern and Reps. Nancy Johnson, Ralph Metcalf, and Jon Nelson, the bill called for peer-mentoring services and a TBI supplemental services program fund.

"When I testified in front of the Legislature, one question posed to me was, 'We have IEPs for kids with disabilities. Why do we need something different?'" Mallberg recalled. "I said that the (current) IEP was based on kids with behavioral issues. Tatum doesn't have that. Kids with behavioral issues frequently know they're doing something wrong. Tatum will go to the bathroom and not remember how to get back. Or he'll open his desk and not remember what he went there for."

SB 2163 resulted in funding for one position in the northeastern part of North Dakota to provide informal training and support services, a position filled by Quinn. There is a similar

I can't imagine how people without my medical background manage.

position for the western part of the state, created during the 2009 legislative session. Quinn said one person for the entire state was not enough. "Thirty years ago, 50 percent of children died from head injuries," she detailed. "Today, 80 percent of children survive head injuries but suffer with significant injuries. So we've invested in acute care. Now we need support services to guarantee good quality of life afterward."

Mallberg is now on the board of the Head Injury Association. She also continues to keep in close contact with Tatum's school. "He is in a special ed program and a very specific IEP," she said. "The school district has been absolutely fantastic."

"A lot of what he needs is patience, repetition, and redirection, and that's different from what people expect, including me. He is my miracle."



Rebecca Quinn

For more information about the Center for Rural Health's activities relating to traumatic brain injury, please visit <http://bit.ly/rZ1BSw>.

'10s

Dinesh Bande, IM Res '11, is now a hospitalist at Sanford Medical Center in Fargo.

Najeeb Hallak, IM Res '11, has joined Sanford Medical Center in Fargo as a hospitalist.

'00s

Gautam Phadke, IM Res '09, was recently hired by Sanford Health in Fargo. Phadke specializes in nephrology.

Derek Brickner, MD '08, recently joined Medcenter One in Jamestown. As a family medicine doctor, Brickner provides health care for infants, children, adolescents, adults, and seniors.

Nicole Gullickson, MD '08, is now at Sanford Southpointe Clinic in Fargo practicing family medicine.

Ryan Hoovestol, MD '08, is now a hospitalist with St. Alexius Medical Center in Bismarck. He is a member of the American Medical Association and American College of Physicians.

David Keene, MD '08, joined the Mercy Medical Center Team at the Craven-Hagan Clinic in Williston in September. Keene specializes in family practice.



Jessica Carlson, MD '08, recently joined Medcenter One in Bismarck as a family medicine doctor. She provides health care for all members of the family as well as performs Botox injections and dermal fillers.

Tyler Price, MD '08, a Minot native, has joined the Emergency and Trauma Center at St. Alexius Medical Center in Bismarck as an emergency medicine physician.

Eric Wiest, MD '08, recently joined Sanford Health in Fargo, specializing in emergency medicine.

Kirsten Juhl, MD '07, is now at Sanford Southpointe Clinic in Fargo specializing in internal medicine.

Jed Perkerewicz, MD '07, was inducted into the UND Hall of Fame as a member of the 2001 football national championship team. The 2001 team finished the season 14-1 after defeating Grand Valley State 17-14 in Florence, Ala., for the title.



Stephanie Miller, MD '07, is now a neurologist at Medcenter One in Bismarck. Originally from Mercer, Miller provides nonsurgical care for patients with disorders of the nervous system—the brain, spinal cord and nerves—including seizures, headaches, dizziness, multiple sclerosis, epilepsy, spine and brain tumors, deformities of the spine, and disc disease and injuries.



Peter Klemin, MD '07, recently joined Medcenter One in Bismarck as an obstetrician/gynecologist. Klemin provides care for women before, during, and after pregnancy and medical care for women's reproductive systems, including preventive care.

Zena Homan, MD '07, has joined the Essentia Health team in Fargo as an Ob/Gyn. Homan focuses on normal and high-risk obstetrics, gynecologic surgery, including minimally invasive procedures, and pelvic floor disorders.

Kimberly Regnier, PA '07, was named Employee of the Month in August 2011 at the Irwin Army Community Hospital in Fort Riley, Kans. Her nomination letter stated that "Ms. Regnier has a very large retiree panel, with over 35% of her patients being over the age of 50 and 75% being over the age of 35," giving her "the most medically intensive panel among the physician assistants at the hospital."

Roxanne Keene, MD '06, joined the Mercy Medical Center team at the Craven-Hagan Clinic in Williston as an orthopedic surgeon in September.



John Miller, MD '06, is now at Medcenter One in Bismarck. As a radiologist, Miller interprets ultrasounds, mammograms, CT scans, MRIs, nuclear medicine studies, and X-rays to diagnose and treat injuries and diseases. He is board-certified through the American Board of Radiology.

Katie O'Brien, MD '06, recently began practicing at the Oakes Community Hospital/Clinic. She is a native of Oakes and did her residency at Hennepin County Medical Center in Minneapolis.

'00s

Daniel Starr, MD '06, is now at Mid Dakota Clinic in Bismarck. He is a member of the American College of Physicians and most recently worked as a hospitalist at Alaska Native Medical Center in Anchorage.

Amy Juelson, MD '05, recently joined the Pediatric and Adolescent Medicine department at Mid Dakota Clinic in Bismarck. She is board-certified by the American Board of Pediatrics and is a Fellow Member of the American Academy of Pediatrics.

Tim Juelson, MD '05, is now at the Bone and Joint Center in Minot.

Jon Machayya, MD '05, recently joined Sanford Health in Fargo and is working in radiology.

Janelle Jones, MD '04, recently joined Colorado Springs Health Partners internal medicine team after her separation from active duty in the Air Force. While serving in the military, Jones held several duties, including pharmacy officer and medical director of Osan AB Lab in South Korea, and director of the Anticoagulation Clinic at the U.S. Air Force Academy.

JoEllen Kohlman-Petrick, MD '04, recently joined Sanford Health in Fargo practicing cardiology.



Douglas Renton, MD '02, was recently named to the new position of endoscopy medical director at Medcenter One in Bismarck. He was selected because gastroenterology involves most endoscopic procedures and he has expertise in evaluating the complete digestive tract.

Debra A. Geier, MD '01, is the new secretary-treasurer of the North Dakota Medical Association. The Association is the professional membership association for active and retired physicians, residents, and medical students in North Dakota.

'90s

Stephen Linn, MD '96, is now at Essentia Health in Fargo in the obstetrics and gynecology department. He was most recently in private practice in Prescott, Ariz., and also worked for the Maricopa Medical Center Residency Program in Phoenix.

Susan Nelson, MD '94, has joined the family medicine department at Essentia Health Clinic in Wahpeton. She focuses on women's health and emergency medicine.

Doug Schlicht, MD '94, was recently inducted into the Fargo South High School Hall of Fame. A 1985 graduate of the high school, Schlicht is the staff anesthesiologist at Appleton Medical Center in Wisconsin. He has been active in medical mission trips to the Dominican Republic and served as an officer in the National Guard and U.S. Naval Reserve.

'80s

Thomas Arnold, MD '84, was recently named the chief medical officer for Catholic Health Initiatives' Fargo Division. Arnold will split his time between his CMO duties and his continued practice as an obstetrics and gynecology physician at the Women's Healthcare Clinic at St. Joseph's Hospital and Health Center, Dickinson, N.D.



Craig Smith, MD '89, recently joined Medcenter One in Bismarck. As an anesthesiologist, Smith provides pain control, pain relief, and care for the patient in the operating room. Originally from Bismarck, he served as a family medicine doctor before becoming an anesthesiologist.

'60s

James Brosseau, MD '68, was presented the North Dakota Medical Association 2011 Physician Community and Professional Services Award during the association's annual meeting. The award recognizes outstanding members of the association who serve as role models, active in both their profession and in their community. Brosseau was recognized for his professional and community work spanning over 35 years in North Dakota.

Richard Anderson, MD '64, donated a signature painting by noted artist JD Challenger to the University of North Dakota Foundation for the benefit of the American Indian Student Services Department. He and his wife Trisha donated the artwork in memory of Richard's mother, Ruth Calkins Anderson. The painting was unveiled at a special ceremony on Oct. 21.

Got news?

We want to hear it!

Please send your news items for the next issue of

North Dakota Medicine to Kristen Peterson:

kristen.peterson@med.und.edu or call 701.777.4305.

David Blehm, MD '81, 59, of Fargo, died Monday, November 7 at his home.

David Milton Blehm was born November 20, 1951, at Mason City, Iowa, to Milton and Irene (Reimann) Blehm. He grew up in Denver and Fort Collins, Colo. The family moved to Bismarck, N.D., in 1965. He graduated from Bismarck High School in 1969. David attended the University of North Dakota in Grand Forks, graduating in 1973. He ran asphalt plants in Montana and Wyoming until 1977 when he started medical school at the UND School of Medicine and Health Sciences, graduating in 1981.

David served a one-year internship in the Internal Medicine Residency Program in Fargo. He completed his pediatric residency at Blank Children's Hospital in Des Moines, Iowa, in December of 1984.

He met Julie Bjerke in medical school, and they were married in Hatton, N.D., on June 15, 1979. His son Ben was born June 13, 1980, and daughter Amy on April 3, 1986.

David practiced pediatrics at Medical Arts Clinic in Minot until 1999, when the family moved to Fargo. He joined Sanford Health in the Pediatrics Department and practiced there until his death. In May of 2011, he became a medical director at Blue Cross/Blue Shield of North Dakota.

He is survived by his wife Julie, Fargo; son, Ben Blehm, Champaign, Ill.; daughter, Amy Blehm, Fargo; parents Milton and Irene Blehm, Loveland, Colo.; brother, Steve (Linda) Blehm, Staunton, Va.; sister, Cheryl (Bernie) Blehm-Poskus, Westminster, Colo.; and numerous nieces and nephews.

Judy G. Sagen (Miller) Dzul, PA '93, 59, of Cancun, Mexico, died September 19 after suffering from a severe heart attack.

Judy G. Sagen, daughter of Garland and Margaret Sagen, was born September 9, 1952, in Devils Lake, N.D. Judy was baptized in Churchs Ferry, N.D. The family later moved to Hillsboro, N.D., where Judy was confirmed. She was also Miss Poppy of Hillsboro and was active in the youth programs of Our Savior's Lutheran Church.

After the family moved to Grand Forks, Judy graduated from Red River High School. She later attended nurses training in Fargo, graduating in 1972. Judy put her training to use at Basin Electric Power Cooperative and volunteered with the Mercer County Ambulance in Beulah, N.D. In the 1980's, Judy and family moved to Hillsboro, where she worked as a nurse at American Crystal Sugar and also volunteered with the Trail County Ambulance.

Judy then went back to school at the University of North Dakota School of Medicine and Health Sciences, and graduated as a physician's assistant in 1993. After beginning her practice, she served for a time as a coroner in Minnesota.

Upon her retirement, she moved to Mexico, where she lived with her husband, Sandy Dzul, until her death.

Judy is survived by her husband Sandy Dzul of Cancun, Mexico; parents Garland and Margaret Sagen, Devils Lake;

children, Noah Miller and his wife Diane, Fargo, Tahirih Field, Fargo; grandchildren, Sydney, Ashton, and Mason; brothers, Kenneth Sagen and his wife Laura, Bedford, Tex., Rodney Sagen, and his wife Trudy, Beulah, N.D.; and several nieces, nephews, cousins, grandnieces and nephews.

Judy was preceded in death by her grandparents Clarence and Inga Sagen and Irvin and Francis Owens; and several aunts and uncles.

Kenneth Stebbins Helenbolt, 87, of Prescott, Ariz., passed away Friday, Oct. 14, of complications from a stroke.

Ken, an only child, was born July 18, 1924, to Carl and Mildred (Stebbins) Helenbolt in Medina, N.Y. He spent his youth in Medina, graduating from high school there in 1942. Ken enlisted in the U.S. Army and served as a sergeant and surgical tech from 1943 to 1946 at O'Reilly General Hospital, Springfield, Mo.

Intigued by the honor system at the University of Virginia, Ken enrolled there in 1946, graduating with a BA in 1948 and an MD in 1952. From 1952 to 1953, Ken served as a surgical intern at the University of Minnesota Hospital, followed by a residency in urology in Minneapolis from 1953 to 1956. While at the University of Minnesota, he met his late wife, Mary Elizabeth Lavin, whom he married on July 22, 1953. Dr. Helenbolt opened his first urology practice in Norfolk, Va., in 1956.

However, in 1959, he decided to live closer to his in-laws. He and Mary packed up the family and moved to Grand Forks, N.D., where he embarked on his 19-year career as a urologist. He practiced alone for 10 years and for the final nine years partnered with Dr. Conrad Doce. In 1978, Ken was named medical director for Blue Cross/Blue Shield of North Dakota, a position he held until 1989. In addition to his medical career, Ken served as professor of surgery at the UND School of Medicine and Health Sciences and a consultant at the VA hospitals in Fargo and the Grand Forks Air Force Base. Upon retiring in 1989, Ken spent summers at a home on Ottertail Lake, Minn., and winters at various southern U.S. locations. Desiring a more permanent home, Ken moved to Prescott, Ariz., in 1997, where he resided until his death. Ken thoroughly enjoyed spending time with his neighbors at Antelope Hills in Prescott.

After the death of his wife Mary, in 1984, Ken married Connie Hiney in 1985. Ken and Connie were married until her death in 2007.

One of his proudest accomplishments was helping to establish a four-year medical school at the University of North Dakota.

Kenneth was always proud of his four children: his daughters Cynthia Karg (Randal) and Jean Parm (James); and his sons Kenneth (Kimiko) and Michael (Nancy). He also took pride in his grandchildren, Philip, Daniel, and Katie Karg, Carl Parm, Kenneth (Tricia) and Kawai Helenbolt, and Cody (Chelsea), Evan, Joel, Sean (deceased), and Kyle Helenbolt.

Dianne L. Iverson MD '81, 62, Grand Forks, North Dakota, died Thursday, October 27, at Altru Hospital, Grand Forks after a brief illness.

Dianne Laurel Iverson was born to Joseph and Verna (Skari) Iverson on November 6, 1948 at Williams County Good Samaritan Hospital, Williston, N.D. She graduated from Watford City High School in 1967 and from the University of Northern Colorado at Greeley with a BA in Music Education in 1971. She taught music at Grand Island High School, Grand Island, Neb., and was also a private piano instructor.

In 1975, Dianne decided to follow her dream to go to medical school and returned to North Dakota to attend the University of North Dakota premed program. She received her medical degree from the UND Medical School in 1981 and began a one-year residency in Portland at the University of Oregon Health Sciences Center in 1982. Dianne again returned to Grand Forks to complete a three-year residency in pathology at the UND Pathology Department/United Hospital. In 1985, after the completion of her residency training, Dianne joined Pathology Associates in Grand Forks. She was currently a pathologist at Altru Hospital, where she worked for the past 26 years.

She is survived by her parents, Joseph and Verna Iverson, Williston; siblings, David Iverson (Tina), Ballantine, Mont., Dean Iverson (Eileen), Ferndale, Wash., Deanna Iverson (Art Lopez), San Jose, Calif., Carlyle Mikkelsen, Columbia Falls, Mont., Sharon Hanson, Grand Forks; a niece, Susan Iverson-Rivers (Terrence), Minneapolis and their daughters, Mikhala and Teagan; nephews, Hal Iverson, Fairbanks, Alas., Michael Iverson, Alexander, N.D., and his daughter, Paiten.

Rita M. Nimz, BS OT '76, 61, of Duluth Township, Minn., passed away Thursday, Oct. 6, at Essentia Health St. Mary's Medical Center. Rita Marie Poeske was born Feb. 22, 1950, in Wausau, Wis., to Norman and Marie (Gassner) Poeske. She grew up in Wausau and graduated from high school there. She attended the University of North Dakota and received her BS in Occupational Therapy in 1976 and later received her master's degree from the University of Minnesota-Duluth. She was employed for a time at St. Mary's Hospital and later for the Special Education Co-Op in Virginia. She was currently employed with I.S.D. 381 in Duluth. Rita was a member of the Duluth Fiber Guild and the Association of Occupational Therapists of America. She was preceded in death by her father. Rita is survived by her husband, David; children Reid (Summer) Nimz of Richfield, Minn., and Abbie (Mike) Roux of Duluth; mother Marie Poeske of Minoqua, Wis.; and three grandchildren, Anna, Edward, and Edith.

Orris O. Rollie, MD, BS Med '44, 89, DeBary, Fla., died Sunday, April 17. Orris was born in Grand Forks. He attended the University of North Dakota, receiving his BS in Medicine in 1944. He then attended the University of Minnesota and received his doctorate from the University of Illinois Medical School in June 1946. He served his internship at Bethesda Hospital in St Paul, Minn.; surgical residency at Midway Hospital in St. Paul; and orthopedic surgery residency at Brooke Army Hospital. While serving in the U.S. Army, he was with the 24th Infantry in Japan as the regimental surgeon.

During his career he held memberships in the Florida Medical Association, Florida Academy of Family Physicians, and American Academy of Family Practice. He also served as ship's physician for about seven years.

At Florida Hospital, he served as director of Family Practice Residency Geriatrics and Family Medicine. He was also director of CME Florida Medical Center, physician consultant for the Aging and Adult Division of HRS, and consultant for the Adult Protective Team and Cares Unit of Orlando.

He is survived by his wife of 43 years Carol, sons Bruce (Diane) Rollie of Stillwater, Minn., Matthew (Amy) Rollie of Tampa, Fla., daughters Jenine (Dean) Selander of Sun City West, Ariz., Noelle (Mike) Rowan of New Smyrna Beach, Fla., brother Robert (Margaret) Rollie of White Bear Lake, Minn., sister Shirley (LeRoy) Vossetieg of Fargo, daughter-in-law Mary Rollie, nine grandchildren and nine great grandchildren. He was preceded in death by a son Michael in 2003.

Stanley Dean Thompson, BS Med '57, passed away on October 26 surrounded by his loving family. Stan was born April 8, 1933, in Fergus Falls, Minn., to Orville and Gladys (Weiss) Thompson. He grew up in Fargo and Page, N.D. A proud Eagle Scout, Stan graduated from Page High School before receiving his BS from the University of North Dakota in 1957, where he was a Phi Beta Kappa member, and his MD from the University of Pennsylvania.

While an intern at St. Luke's Hospital, Stan met Denise Lindseth, a nursing student who was to become his wife of 50 years. They were married on May 19, 1962.

Stan completed a residency in radiology at the Mayo Clinic, in Rochester, Minn., before moving with his family back to Fargo, where he worked for 38 years as a radiologist with St. Luke's Hospital and MeritCare.

He was preceded in death by his parents, Orville and Gladys. He is survived by his wife, Denise; by his children Dr. Brent (Erika) Thompson, of Northville, Mich., Jeff (Jennifer) Thompson, of Phoenix, Ariz., and Michelle (Dr. David) Stover, of Horace, N.D.; and by his grandchildren, Kyle, CJ, Maggie Mae, Allie, and Emily; and his brother, Bruce.



Electronic Health Records: the

By Aaron Ortiz



Sarah Baker



Ryan Zimmerman

Imagine sitting in front of your computer, the cursor blinking, waiting to accept information from thousands of patient charts that need to be transferred into your brand new electronic health record (EHR) system.

Sound like a tough day at the office? Don't worry; you're not alone. All over the country, hospitals and clinics have been busy responding to the mammoth task of switching from paper charts to electronic records. Early adoption from a revenue perspective means additional reimbursement and incentives from the Centers for Medicare and Medicaid Services; failure to adopt eventually means lower Medicare and Medicaid reimbursement payments to health care facilities. For patients, EHRs can lead to an increase in communication between the various health care providers they see. From a provider standpoint, enhanced quality of care could also mean an increase in revenue, since reimbursement for quality is usually tied to documentation of care delivered.

To get some perspective on implementation, benefits, and challenges, we asked two providers in North Dakota to talk to us about how their EHR system is working. Sarah Baker is a nurse practitioner at Northland Community Health Center in Turtle Lake, N.D. Ryan Zimmerman is a family medicine physician at Medcenter One in Dickinson, N.D. These providers offer us insight into the good, the bad, and the ugly of EHRs.

Both Zimmerman and Baker used an EHR during their training. "We used an EHR fairly extensively during residency," said Zimmerman. "In fact, the one we used is the same one that we utilize in our practice now. That made the transition from residency to practice a little easier."

Like clinics across the country, not every training program has a fully integrated EHR system yet. "I used an EHR during my nurse practitioner training," Baker said. "The clinic didn't have the system fully integrated yet. The emergency department I trained in did have theirs fully up and running, though, so I was able to see what a fully operational system would be like."

The utilization aspects both providers touch on are important from a quality perspective. According to a study published by the *Annals of Internal Medicine*, electronic health records that feature advanced functionality have positive implications for quality health care delivery. In relation to electronic health records changing daily workflows, Zimmerman believes that it will vary from system to system and provider to provider. "Some providers feel more comfortable in an electronic records system and some don't," he said.

Baker is at a different stage of implementation and has found that it's taking a bit more time to enter information into an EHR than the paper chart. "Once we implement a few templates, it'll get faster," she said. "One huge timesaver though is e-prescribing. We end up spending less time on the phone with the pharmacy."

An article published by the *New England Journal of Medicine* echoes Baker's concerns. A major roadblock to health facilities adopting a system has been the change in how providers capture patient data. This barrier has been reduced in recent years, though. With improvements in the areas of free text, template data, dictation, and speech recognition, it has been easier to get patient information into the system. Baker cautions against the use of too much free text though. "Every time you enter a generic note, instead

Good, the Bad, and the Ugly

of drilling down into the correct part of the patient system, that is, entering a note into the field for ear, nose and throat, instead of the larynx field specifically, the issue becomes unretrievable data," she said. "Essentially, it's like using a paper chart all over again. It's going to take the same amount of time to search for specifics if you're not using your EHR to capture the correct information in the right place."

The best relationships are built on foundations of solid communication. So how well do rural clinic EHRs link to larger tertiary facilities' systems around the state? For Zimmerman, it's a match made in heaven. "We're tied into Medcenter One in Bismarck. From a primary care perspective this is huge; I get all the notes back from consults, and they don't have to fax them to me," he said. "Direct communication like this reduces the amount of labs and images we run. It's not only a cost saver for us, but for the patient as well."

But not every clinic in the state is lucky enough to have that bidirectional information exchange portal.

"Communication with Bismarck is something we're still working on," Baker said. "I think the danger of facilities implementing systems quickly is that they back themselves into a situation in which there is no basic platform for their EHR to communicate with other facilities and exchange patient information."

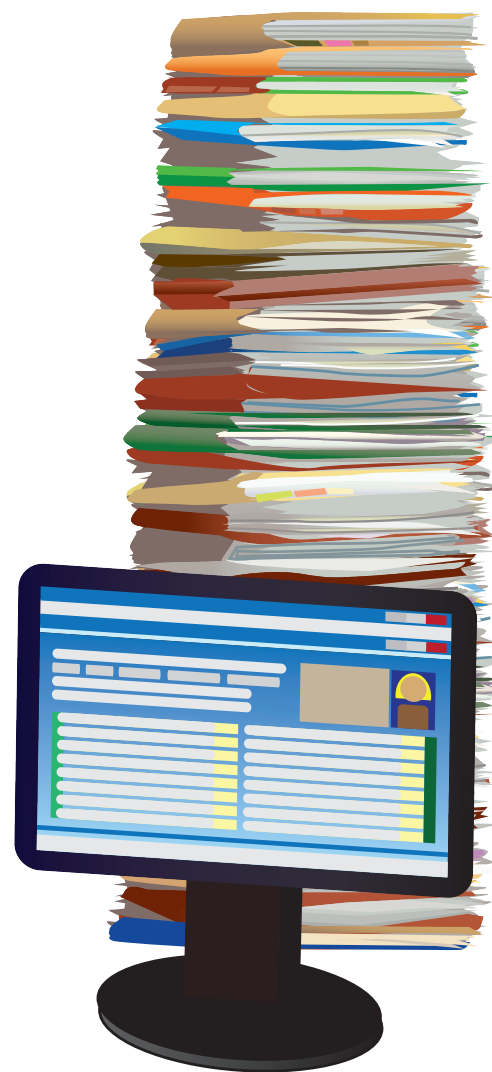
It's clear from both of their statements that they believe the alignment of clinics and larger

health facilities is necessary to provide better service and higher quality of care for patients.

With a system that clearly has the ability to improve quality and potentially save time and money, what are the overall views of our North Dakota providers?

Zimmerman said, "The benefit I see out of all of this is our patients are going to eventually have access to patient portals. They'll be able to log on and see labs, images, and notes from their physicians, maybe even set statuses. It'll be like the Facebook of medical information. We're going to see enhanced care coordination and less paper clutter, a pretty sustainable benefit of going paperless!" Baker echoes Zimmerman's statements regarding patient portals. "As a consumer of medical services, it'll be nice to go on and see my labs and other tests," she said. "I'm a health care provider, and I can't even remember that stuff. Patient portals are going to be great for our patients!"

Both providers would agree that making the switch isn't always easy for systems or providers. "If you're a physician in a solo practice and you've been doing paper charting for 20 plus years, it's going to be hard to implement an EHR efficiently and effectively," Zimmerman said. "It's a big change; change is hard." Clearly though, our two providers would agree that patient portals and increased communication between providers will lead to positive implications for the quality of care that patients are receiving, a benefit that everyone can appreciate.



Bridge Builder

A surgeon's journey leads to better care for rural North Dakotans.

By Denis MacLeod



Enej Gasevic

Born and raised in Mostar, Bosnia, Enej Gasevic was swept by the winds of war to the plains of North Dakota. In mid to late 1993, at the age of 17, he fled the conflict in Bosnia with his mother, father, brother, and grandmother as well as two younger cousins who were living with Gasevic's family and were separated from their parents. All seven eventually ended up in a refugee camp in Turkey.

In 1994, the Gasevics and the young cousins were given the opportunity by Lutheran Social Services of Fargo to immigrate to the United States. It would take a couple of years before Gasevic's cousins would be reunited with their parents, who finally found their way to the United States.

Enej Gasevic's father was a teacher and principal at a grade school in Bosnia for 20 years, but in Fargo, the only work he could find was at a slaughterhouse. Gasevic was 18 when he arrived in the United States. He had completed only two years of high school in Bosnia because his school had burned to the ground from artillery shelling. His two options for completing high school were to go back and finish in about three years or take the General Equivalency Degree tests.

"At this stage of my life, I didn't have anything in common with 15-, 16-, or 17-year-olds in high school," Gasevic said.

Gasevic studied English in grade school and high school in Bosnia, so he had a good command of the language. He studied for the GED exams and passed the tests in 1994. "I knew I wanted to go to college," Gasevic said. But his family couldn't afford to pay nonresident tuition to attend college in North Dakota, so he worked in a warehouse for a year to establish residency.

"One thing I appreciate about North Dakota is that if you are willing to put forth the work, the opportunities are there."

Gasevic knew that he wanted to go to medical school. A major influence was witnessing the collapse of the health care system during the war in Bosnia. "A lot of medical care was delivered by Doctors without Borders," Gasevic said. "Seeing physicians from Western European or North American countries, who clearly have things going pretty well for themselves at home, make the sacrifice to come to a war-stricken country and attempt to help my friends and neighbors had a positive effect on my pursuit of a career in medicine."

But everything Gasevic had heard from people was how difficult medical school was, even for talented students. "So I thought it would be prudent to have something other than premed as a major," Gasevic said. "I had significant interest in zoology and had at one point considered doing research in the field." He earned a Bachelor of Science in Zoology from North Dakota State University in 1999.

He still had the abiding dream of going to medical school, so Gasevic took the MCAT. "I did pretty well," Gasevic said. "I couldn't afford to go to 10 or 20 interviews. I applied to the UND School of Medicine and Health Sciences and a few other schools. I got an invitation from UND; they seemed to like me, so I didn't even go anywhere else."

Gasevic was unsure about a medical specialty until late in medical school. "For a long time I wanted to be a primary care, a family practice, or internal medicine doctor," he said. "With more exposure, I kept thinking that dealing with sicker patients and high-acuity of care would be more interesting. I am relatively hands-on, relatively mechanically inclined, so fixing things comes naturally. At some point, I got exposure to critical care, and I thought that would be interesting." But what really provided a spark was when Gasevic did his surgery rotation. "I really

liked it; I really loved what those folks were doing. It just seemed to fit."

Some uncertainty about choosing surgery as a specialty dogged Gasevic. "I questioned myself a number of times, thinking 'Is this really what I want?' But everything else paled in comparison. Maybe I was just shallow because I need that immediate gratification, but you can actually do something and affect the outcome pretty quickly—you start with a patient who was previously healthy who gets injured, needs help, gets help, gets better, and gets back to being healthy, and productive."

Gasevic's first surgery rotation was with Mike Traynor at Sanford Health, Meritcare at that time, in Fargo. "He certainly was a great teacher and a great influence. I thought, 'This guy does some interesting and important work.'"

At commencement in May 2003, Gasevic won the Arnold P. Gold Foundation Humanism in Medicine Award. For his five-year surgery residency after

medical school, from 2004 to 2008, Gasevic was in the General Surgical Residency Program at Henry Ford Hospital, a Level-I trauma center in the heart of Detroit, where in 2007–2008 he was chief resident in general surgery.

The volume of patients and the acuity of their cases at Henry Ford Hospital were worlds apart from North Dakota. "I honestly thought that 'Here, I can get ten years of experience in about a year,'" Gasevic said.

During his residency in Detroit, Gasevic found that he was most interested in trauma and critical care surgery as a subspecialty. He stayed for an additional year at Henry Ford to complete a Surgical Critical Care Fellowship. "I already knew that I was coming back to North Dakota at that point." The same day Gasevic signed his critical care fellowship contract, he had also signed a contract to return to Sanford Health in Fargo, because they were interested in someone with trauma experience to join them a year later.

In 2009, during his fellowship year, Gasevic married Lejla, an architect, whose family are also Bosnian immigrants living in Fargo. Enej and Lejla have one child, Luna, who just turned two years old.

Gasevic returned to Fargo not only to be with family but also to give back to the community that he said has done a lot for him. "I wonder if I would have had the same opportunities if I were somewhere on the East Coast or West Coast; maybe, maybe not."

Before Gasevic moved back, North Dakota had two trauma surgeons. His arrival made three. The state now has five. "It's not a very common profession," he said.

Throughout his residency and even before, Gasevic developed an interest in teaching. "I really liked the idea of teaching. Taking time to help teach the next generation how to do the work has always struck me as important work worth doing."

"If we don't teach the next generation how to do this, there probably won't be anyone to take care of us," Gasevic said. "Dr. Robert Sticca got me interested in helping out at the School of Medicine and Health Sciences." In 2009, Gasevic joined the clinical faculty of the Department of Surgery, where he is an assistant professor on the Southeast Campus in Fargo. In July 2010, he became associate program director for the Surgery Residency Program.

Gasevic noted the department's strengths in research and in recruiting students interested in the rural track program. After the first year of their five-year surgery residency, UND's surgery residents are required to do a research project each year. "UND's Surgery residency program is ahead of the curve in regard to research," Gasevic said.

He is particularly proud of the Surgery Residency

Program's rural track, where the idea is to better prepare residents for the realities of practicing in a small community frequently isolated from the help of a large

support staff. "For a state that is largely rural, that is extremely important," Gasevic said. "Most surgery rotations are located in large population centers. But if you look at where most jobs are open or where they are searching for a surgeon or that are understaffed, they are going to be rural."

"The only way that our state is going to have a reasonable, if you will, a reliable supply of surgeons is to have a program in state. Get some of our own local folks to go into our program and go back and end up practicing, potentially, in the communities that they have ties to. It is going to be extremely unusual for us to reliably hire somebody who has no ties to the community and keep them longer than the couple of years that their contract runs through."

The School's Surgery Residency Program rural track takes a year. Each year, one of the three surgery residents participates in the rural track. The residents complete rotations in rural settings that do not have the specialists that exist at tertiary medical centers (large hospitals in large cities). At tertiary hospitals, if a doctor needs to evaluate a fracture, they can always call an orthopaedic specialist. If a patient needs an ear, nose, and throat specialist or has a urologic emergency, the primary doctor can rely on a subspecialist for consultation. The rural track program prepares residents to practice in hospitals where these specialists are not immediately available.

"If you are in a city that is 300 miles from help, you need to know how to take care of those things, at least temporize them," Gasevic said. "We have had tremendous interest from our applicants about the rural track."

So building new bridges by teaching surgery residents to serve rural North Dakotans seems to be fitting work for the mechanically inclined immigrant from Mostar, which means "old bridge."

One thing I appreciate about North Dakota is that if you are willing to put forth the work, the opportunities are there.



Is There a Physician Assistant

By Jeanie McHugo, PhD, PA-C, Director, UND PA Program

in the House?



Nurses from Altru Health System demonstrate proper gowning technique to the PA students.

The increasing geriatric population, changing economy, rural clinician turnover, and shortage of primary care providers are certainly current challenges for health care in the United States. The challenge of the changing tide of how health care is delivered is broadening opportunities for the role of the physician assistant. What is a physician assistant? A physician assistant (PA) is a nationally certified health care professional licensed by the state to practice medicine as part of a team with a physician. Within the physician-PA relationship, PAs exercise autonomy in medical decision-making and provide a broad range of diagnostic and therapeutic services. As part of their comprehensive responsibilities in medical and surgical services, PAs play an instrumental role by counseling patients on preventive health, conducting physical examinations, and diagnosing and treating illnesses. In some rural areas where physicians are in short supply, PAs serve as the primary providers of health care, conferring with their supervising physicians and other medical professionals as needed and as required by law. This benefits the medical practice by easing access issues, reducing waiting times, increasing patient satisfaction, and allowing more time for physicians to handle more complex medical cases.

The University of North Dakota Physician Assistant Program celebrates over 40 years of continually meeting the mission of preparing selected health care professionals to become competent physician assistants working collaboratively with physician supervision, emphasizing primary care in rural or underserved areas of North Dakota, the United States, and the world. The PA Program at UND is the only PA Program in North Dakota and is unique in that it is geared to the licensed and experienced clinically practicing

professional who wishes to change professions and become a physician assistant.

By educating students in the medical model designed to complement physician training, the UND PA Program offers an intense 24-month, entry-level Master of Physician Assistant Studies (MPAS) degree for individuals wanting to learn the skills and knowledge to enter the PA profession.

All applicants have a minimum of three years of experience as a licensed or certified health care professional (average years of clinical experience of the current class is 12 years), and there is a diversity of clinical health professions in the classroom, such as nursing, respiratory therapy, medical technology, chiropractic care, paramedicine, radiologic technology, exercise physiology, athletic training, military corpsman, and nuclear medicine.

Meeting Our Mission

The UND PA Program selects applicants from rural areas, trains them in rural areas, and is pleased to report the following from the 2010 graduate survey (55% response rate):

- 85% still reside in the same city or town where they lived when they graduated (trained and retained as medical providers in home areas);
- 65% are practicing in primary care (includes family medicine, urgent care, internal medicine, and women's health);
- 55% are practicing in a rural area (defined as 25,000 or less population); and
- 97% are currently satisfied with their job selection.

As evidenced by the recent statistics, the philosophy of "growing your own" is successful. At the UND PA Program, we welcome the opportunity and embrace the challenge!

FACULTY OF 1000

Paper by UND biomedical researchers is selected as one of the best of 2010 - 2011

By Juan Pedraza

A peer-reviewed paper coauthored by UND School of Medicine and Health Sciences researchers Pan-Yue Deng, Zhoyang Xiao, Chuanxiu Yan, Lalida Rojanathammanee, Jonathan Geiger, James Porter, and Saobo Lei was recently selected by the international Faculty of 1000 (F1000) as one of the best published in the last year.

Lei, a physician and PhD pharmacologist in the School's Department of Pharmacology, Physiology, and Therapeutics (PPT), is the lead author of the paper titled "GABA_B Receptor Activation Inhibits Neuronal Excitability and Spatial Learning in the Entorhinal Cortex by Activating TREK-2 K⁺ Channels."

Faculty of 1000 is an impressive group of the world's leading scientists who regularly review thousands of papers and characterize a few—all listed on their website—on a three-tiered scale from must-read to recommended.

F1000 identifies the most important articles and trends across biology and medicine. Articles are selected from those in more than 3,000 peer-reviewed scientific journals, which are then rated and evaluated by F1000's peer-nominated faculty of over 10,000 expert clinicians and researchers who explain why the papers they recommend are essential reading for their fellow researchers. Basically, it's a rating service that tells other scientists what's worth reading among the hundreds of thousands of papers published annually just in the biomedical field.

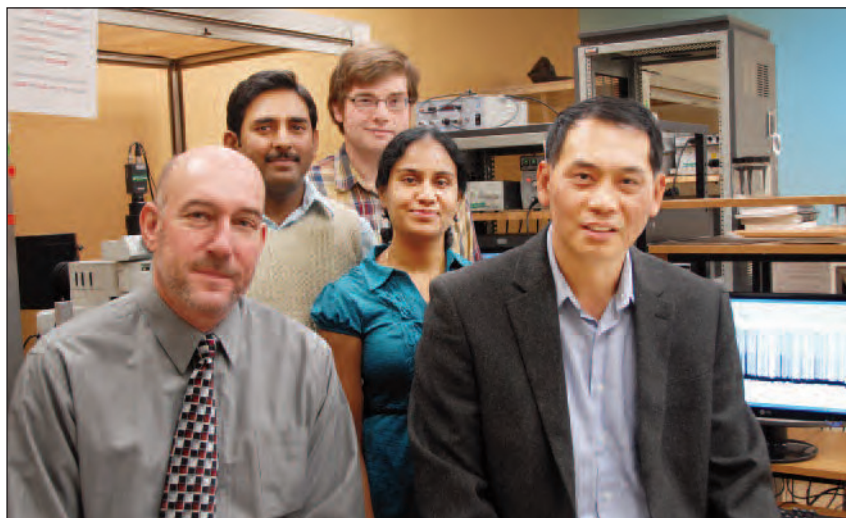
F1000 selected the UND paper, which, very broadly, deals with the biochemical aspects of spatial learning, as being within the top 2 percent of all published articles in the biological and medical sciences.

Lei's work at the SMHS focuses on how individual neurons behave at the cellular level, work that eventually could lead to a better understanding of brain problems, such as memory loss, learning disabilities, anxiety, Alzheimer's, and epilepsy. He and his coauthors explored a neural receptor's tight control over spatial learning. The article was originally published in the peer-reviewed journal *Neuron*.

"We use a variety of techniques including electrophysiology, immunocytochemistry, imaging, tissue culture, molecular biology, and

in vivo physiology using animal models to study the functional changes of the central nervous system in physiological and pathological conditions," Lei said, describing his lab's key research focus.

Lei explains, "The functional changes of neurons induced by the neurotransmitters and neuromodulators are likely to be responsible for a



A few members of the PPT research team (left to right), Jonathan Geiger, Manojkumar Jaiswal, Nick Cilz, Lalitha Rojanathammanee, and Saobo Lei

variety of physiological functions such as learning and memory or clinical disorders, including epilepsy, anxiety, and neuro-degenerative diseases. We are using in vivo disease models to study the roles of these neuromodulators in these clinical disorders. Our research would likely provide clues at the molecular and cellular levels to treat neurological diseases."

Coauthor Jonathan Geiger is Chester Fritz Distinguished Professor and chair of Lei's department.

Coauthor James Porter, PhD, is a pharmacologist in PPT with a research focus on understanding the molecular mechanisms of drug action and verification of potential therapeutic targets.

Coauthors Pan-Yue Deng, Zhoyang Xiao, and Chuanxiu Yan returned to the People's Republic of China after completing their post-doctoral work at UND. Lalida Rojanathammanee is a post-doctoral scholar at the SMHS.



By Kimberly Krohn, MD, MPH, FAACP, Program Director, Center Minot Center for Family Medicine

It's been six months since Minot was hit by record-breaking floodwaters, dashing the belief of most residents of the city that water-control projects completed on the Mouse River over the past four decades would protect the city from such a disaster. Among the many organizations affected by the Minot flood was the UND Center for Family Medicine, including the Family Medicine Residency Program and clinic. Though fortunately located well out of the floodwaters' reach, the staff, faculty, and trainees had stressful circumstances to deal with during and as a result of the flood. The floodwaters have finally receded, but the reparations continue.

One of the Center's trainees, Dr. Mark Longmuir from Stanley, says it was like when Kennedy was shot for some people. "I'll never forget sitting in noon conference and learning we had a short period of time to move out," he said. They were told they had five days, but ended up moving out in 36 hours. Their rental home, located right next to the river, took on nine feet of water. His family of five had nowhere to go except to pack up and move out to Stanley, 50 miles away.

Four of the Center staff and one of the employees of the UND Center for Rural Health living in Minot experienced disastrous flooding of their homes. One of the faculty members and her family were evacuated for two months, living with friends. Since the evacuation, most of the others have been living in recreational vehicles and now are moving into FEMA trailers brought in by the Federal Emergency Management Agency. Around 4,000 structures in the city were lost in the flood. According to the *Minot*

Daily News, only 3 percent of flood victims had returned to their homes as of the end of October. Flood victims await news of redevelopment plans so they will be able to predict the future of their neighborhoods and their ability to salvage their homes.

Many staff, faculty, and resident physicians have helped other flood victims by assisting in moving housefuls of furniture, hosting evacuees, and storing valuable items for long periods of time. The patients served by the Center are all affected by the disaster in the community as well. Though no lives were lost in the flood, the trauma to the community continues. Many Minot residents have left town because of the lack of housing, creating staffing shortages in health care and other organizations. The new first-year residents and new CFM faculty member Kwanza Devlin, MD, found their prearranged housing unavailable as they arrived in Minot to start at the Center on July 1. It's been a struggle since, and candidates for faculty and resident positions are fearful that they will not be able to find affordable housing when and if they secure jobs in Minot.

During the flood, the major north-south routes in Minot were closed to traffic, making getting around town extremely difficult. A three-mile trek to the clinic became a 90-minute ordeal some days. The clinic never closed, and in fact became the site of the residency graduation on June 28, because I was concerned that if the planned graduation site on North Hill of Minot were used, the entire physician complement of the clinic could become stranded on the wrong side of the river from the clinic and hospital. The staff and a local caterer pitched in to make graduation special, which we held in the lobby of the clinic building. Though the 250-bed Trinity Nursing Home was evacuated, Trinity Hospital remained open and none of the residents lost training time. Several residents and faculty volunteered at the North Hill clinic and emergency center equipped by Trinity Hospital to provide urgent care for residents of the north part of the city.

Currently, Minot is bustling to make sure new housing is being built and the flooded homes get closed up enough to be able to have their foundations heated throughout the winter. The FEMA trailers are providing temporary shelter and the community shelters are getting closed. The residency program remains dedicated to serving our community as it rebuilds and hopes for better times to come.



This is the house of Bruce and Louise Bogenrief during the flood. Louise is a pharmacist with the UND Center for Family Medicine in Minot.

Sports Medicine Concept

By Steve Westereng, MS, ATC, CSCS, Assistant Professor and Director of Sports Medicine

I meet with many prospective Bachelor of Science in Athletic Training students each year who want to go into “sports medicine.” This often leads to a greater discussion to clarify the difference between sports medicine and becoming a certified athletic trainer.

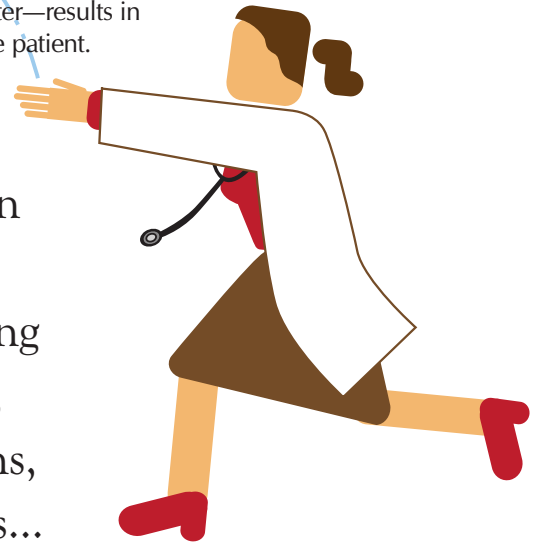
In many current settings, the certified athletic trainer (ATC) works directly with athletes on a daily basis to provide injury assessment, rehabilitation, treatment, and prevention of sports-related injuries. In a broader view, the ATC is the first allied health care provider to interact with an athlete. This may be as simple as a question regarding an injury or as serious as an emergency, depending on the situation. Obviously, the athletic trainer cannot handle every situation independently, and this is where the concept of sports medicine comes in.

Sports medicine is a concept, or team approach, to caring for the physically active or athletes. This team approach can and should include many different personnel from diverse

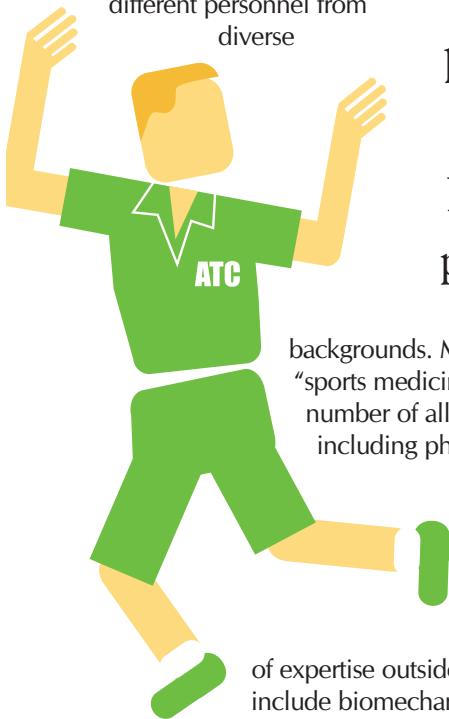


before they care for an athlete as a patient, and, more specifically, address that patient’s goals. The ATC serves as the “hub of the wheel” in directing the athlete to all of the health care specialists who can assist the athlete in trying to achieve his or her goals. The ultimate goal for all involved should be to return the athlete to competition quickly and safely. However, should it be any different when dealing with a worker who is not able to acquire a paycheck because he or she is unable to work? Sometimes health care providers ask patients to wait and the problem will get better; however, in most cases, a proactive approach—diagnosis directly to rehab vs. diagnosis and wait to see if it gets progressively better—results in better care for the patient.

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a ‘sports medicine team’ can have any number of allied health professionals, including physical therapists, nurses, EMTs, pharmacists, dietitians, psychologists, and physicians...



backgrounds. Medically speaking, a “sports medicine team” can have any number of allied health professionals, including physical therapists, nurses, EMTs, pharmacists, dietitians, psychologists, and physicians from different specialties to name a few. Examples

of expertise outside of the medical field may include biomechanics, exercise physiology, and strength and conditioning. Post-graduate sports medicine fellowships for physicians and specialized training in dietetics are examples of a more structured approach for professionals to learn the sports medicine concept. However, in most cases, allied health professionals have not received formal sports medicine training

Health Sciences has housed the Division of Sports Medicine (DSM) for 20 years within the Department of Family and Community Medicine. The DSM has provided a home for the nationally accredited Bachelor of Science in Athletic Training (BSAT) undergraduate degree, a fourth-year medical student sports medicine elective rotation, and clinical education for physical therapy students. The DSM also provides athletic training services to the Department of Athletics. In addition, the UND Center for Sports Medicine, an outpatient rehabilitation facility on campus, provides care for athletes and non-athletes within the University, Grand Forks, and the surrounding area. There currently is a push nationally to house athletic training academic programs in schools of medicine or allied health such as is done at UND. UND’s model is unique. As stated by the Commission on Accreditation of Athletic Training Education in their last BSAT accreditation visit, “This [UND] model has provided many benefits to the program, which can be shared with and used as a model for others to follow.”



The Charitable Remainder Trust

By Dave Miedema

Finding simple, tax-wise solutions to tough financial and estate planning questions can be challenging. This includes when your plan involves your desire to do something especially meaningful for the benefit of organizations important to you, such as the UND School of Medicine and Health Sciences. But there exists a powerful charitable giving arrangement that may help you and your professional advisors address certain potential planning concerns — the Charitable Remainder Trust.

First, don't let the name throw you. A Charitable Remainder Trust, or CRT, is not as complicated to understand as some might initially think. It's actually quite simple. Like conventional trust arrangements, a CRT is funded with appropriate assets that are invested and managed by a trustee. Some of the investment earnings or principal are paid out as income to one or more beneficiaries for a specified length of time. In a nutshell, that's it. But a key difference from conventional trusts is that when a CRT matures, the principal balance is distributed to one or more qualified charities, such as the UND Foundation (instead of to your family members or friends), for the ultimate benefit of the School of Medicine and Health Sciences.

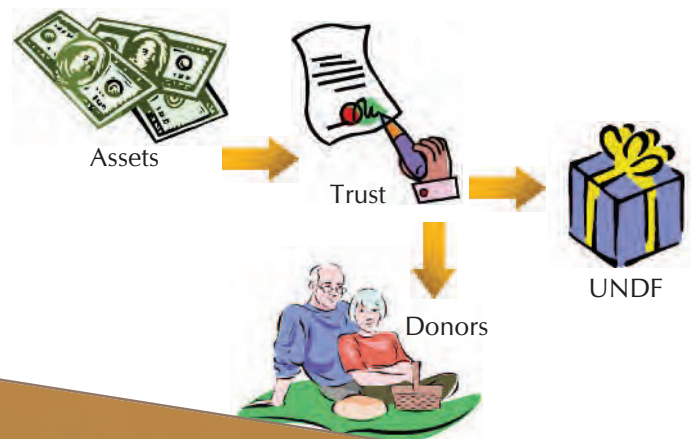
The features and benefits of a CRT are numerous. Here are a few:

- * Receive a federal tax deduction for the "charitable remainder" portion of your gift. This deduction will save you on income taxes today.
- * Receive income for life, lives, or a specific term of years. Unlike an "outright" gift of cash or other assets, a CRT will provide you or family members something in return for your gift — income! There also exists the potential that your income could increase over time with growth of the CRT

assets, thereby providing a hedge against inflation.

- * If funded with long-term, capital gain-type assets like stocks or real estate, you avoid paying the capital gains tax you would otherwise pay on a sale of such assets. Funding a CRT with highly-appreciated property can, therefore, be an especially tax wise gift.
- * Unless income is distributed to someone other than you or your spouse, the CRT assets are removed from your estate and thus not exposed to potential additional tax.
- * Most of all, you are providing for a future, meaningful gift to benefit the School of Medicine and Health Sciences. Establish a named endowment, or even an endowed professorship or chair, with the "charitable remainder" of your income gift.

Charitable Remainder Trust



For more information, or to receive a personalized illustration of how the CRT potentially could work for you, please contact:



Dave Miedema, Director of Development
School of Medicine and Health Sciences
UND Foundation
davem@undfoundation.org
(701) 777-4933
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First-year medical student Mat Malek accepts his stethoscope from his Adopt-a-Student sponsor Dr. Heidi Bittner and Dean Joshua Wynne.



Rebecca Lessard, Julie Dahlman, and Jack Chatt promote breast health in October, Breast Cancer Awareness Month.



The American Indian Health Conference featured speaker Dr. Gayle Skawennio Morse.

Dean Joshua Wynne welcomes new College of Nursing Dean Denise Korniewicz at a reception held in her honor at the School.



More than 40 GF-EGF Chamber of Commerce members toured the School's simulation lab when the School hosted Business After Hours.



Annette Larson (center) is joined by Elizabeth Ring, PA-C, and Dr. Bruce Ring at Larson's Farewell Celebration.



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For more information on the North Dakota tax credit opportunity, please contact Dave Miedema, Director of Development, School of Medicine and Health Sciences at davem@undfoundation.org, call 701.777.4933 or 800.543.8764 or visit spirit.und.edu.

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Please note that every effort was made to include all donors who made gifts, new cash pledges, or payments on existing pledges by June 30, 2011.
If we have omitted your name in error, please accept our sincerest apologies and contact us so that we may make corrections as needed.

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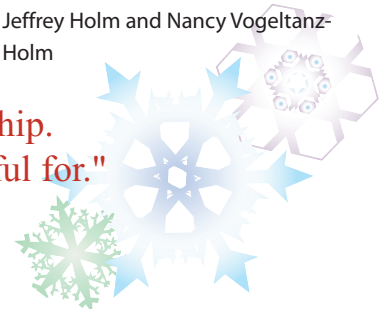
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Your support of my education is truly a blessing that I am enormously grateful for."

Laura Luick, Second-Year Medical Student



I truly appreciate your generosity in selecting me as a recipient of an Academic Achievement Award. I can't even describe how helpful this award has been to us in the past three years. I hope to one day contribute to other students' education in such a way.

Meredith Resenauer, Fourth-Year Medical Student

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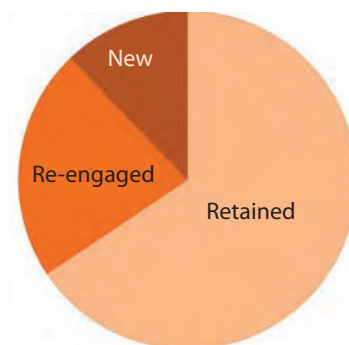
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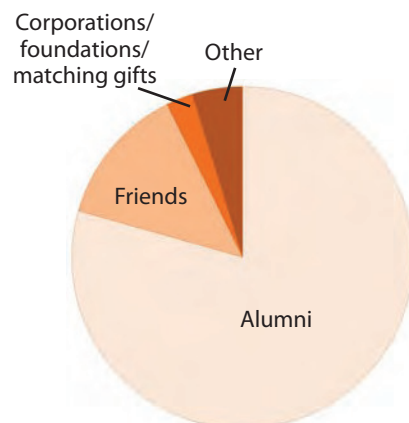
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Thank you so much for this unbelievable gift you have given me. This scholarship will greatly lift the anxiety that the financial burden of medical school produces. It is just one more thing that the UND SMHS has done to positively change my life.

Krishan Jethwa, Third-Year Medical Student

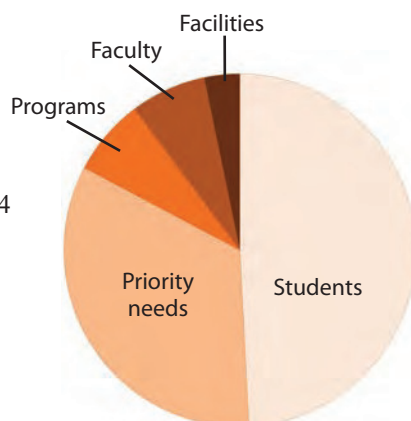
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Programs: \$53,910
Faculty: \$53,165.62
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I am honored to be the recipient of the Charles and Emma Bollinger Memorial Scholarship this year. I will eventually become a doctor of medicine and serve people in need. I strongly believe that we have a responsibility to serve one another, and I am convinced that the medical profession is the best avenue for me to fulfill this obligation.



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We extend special thanks to all who contributed to the School of Medicine and Health Sciences through the UND Foundation this past fiscal year ending June 30, 2011. Your meaningful support is both necessary and deeply appreciated as we strive to move the School from excellent to exceptional!

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The North Dakota Spirit Campaign's goal for the School of Medicine and Health Sciences is \$35 million. We are pleased to share that after including \$766,553 committed this past fiscal year, we have recorded a six-year total of \$23,274,398 in gifts, moving us toward nearly 70 percent of our stated goal. This impressive Campaign total comprises annual contributions, pledges, and deferred gift arrangements of various types. All of these gifts offer certain tax benefits, but above all, donors enjoy the satisfaction of supporting a superior, community-based medical and health sciences school that is especially vital to maintaining the good health of the citizens of North Dakota. For specific information about how the School of Medicine and Health Sciences works to educate students, discover new knowledge, and serve North Dakota, please read the School's 2011 community report *Vital Signs*, which is available online at: <http://bit.ly/oJ43ok>. Limited print copies are available by



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UND School of Medicine and
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UND Foundation

Joshua Wynne, MD, MBA, MPH
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Donors who choose to establish endowments are committed to supporting activities not just for one year, or even one generation, but for perpetuity. By their very nature, endowments require the consideration of current and future needs. Endowments provide the stability necessary for UND to remain the premier liberal arts university on the Northern Plains.

An endowment can be established through the UND Foundation and named with a minimum gift of \$25,000 and funded over time or with a deferred gift arrangement. Donors may also choose to designate gifts to existing endowments held within the UND Foundation to grow their base of support.

In the 2009 fiscal year, the following eight new endowments were established with the UND Foundation to benefit students, faculty, and programs within the School of Medicine and Health Sciences.

Craig and Jewel Lambrecht Endowment

Donors: Craig and Jewel Lambrecht

To support the Simulation Lab at the UND School of Medicine and Health Sciences.

Dr. Cecil and Penny Chally Medical Scholarship Endowment

Donor: Cecil H. Chally, M.D.

To provide scholarship assistance to qualified students within the UND School of Medicine and Health Sciences who are earning a medical doctor degree.

Dr. Steve and Sue Laxdal Scholarship Endowment

Donors: Stefan and Sue Laxdal

To provide one or more academic scholarships to qualified students within the UND School of Medicine and Health Sciences.

Dr. Walter Wasdahl and Dr. Robert and Kay Hedger Endowment

Donors: Dr. Robert and Kay Hedger

To provide one or more scholarships to qualified medical students within the UND School of Medicine and Health Sciences who have a demonstrated financial need.

George B. Talbert Family Medical School Endowment

Donors: Dr. George* and Rosalie* Talbert

To support the varying educational opportunities and scholarship needs of a student at the UND School of Medicine and Health Sciences.

Henry C. "Bud" Wessman Physical Therapy Quasi-Endowment

Donors: Multiple

To fund the highest priority needs of the Physical Therapy Department at the UND School of Medicine and Health Sciences.

Mack and Rita Traynor Medical Scholarship Endowment

Donors: Dr. Mack* and Rita Traynor

To fund one or more medical student scholarships for students who graduated from a North Dakota high school and who are enrolled in the UND School of Medicine and Health Sciences.

Phyllis Schaefer Memorial Endowment

Donors: Corinne and Kent Busek, Deborah L. Kukowski, Andrew J. Schaefer

To be used for cancer research, with preference being given to research currently being conducted by Dr. Robert Sticca, chair of the Surgery Department.

*Deceased



The UND Foundation, an independent non-profit organization, raises and manages funds that secure a strong future for UND, SMHS, and their students, faculty, and alumni.